



ANNALS OF THE
ROYAL COLLEGE
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VOLUME 29

SEPTEMBER 1961

No. 3

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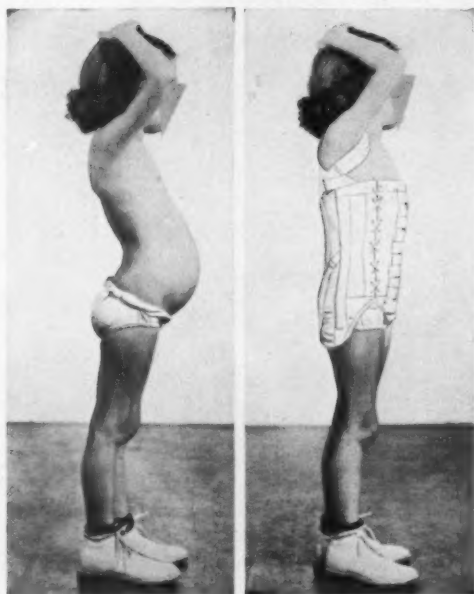
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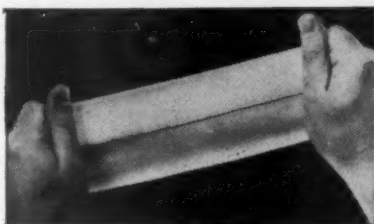
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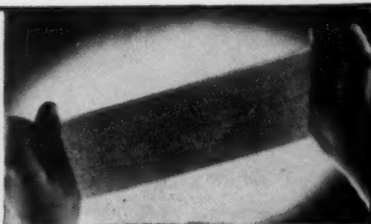
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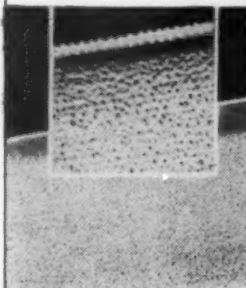
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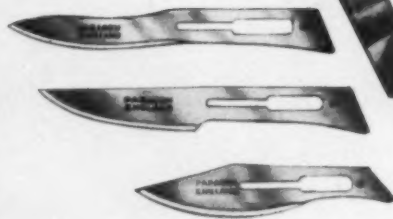
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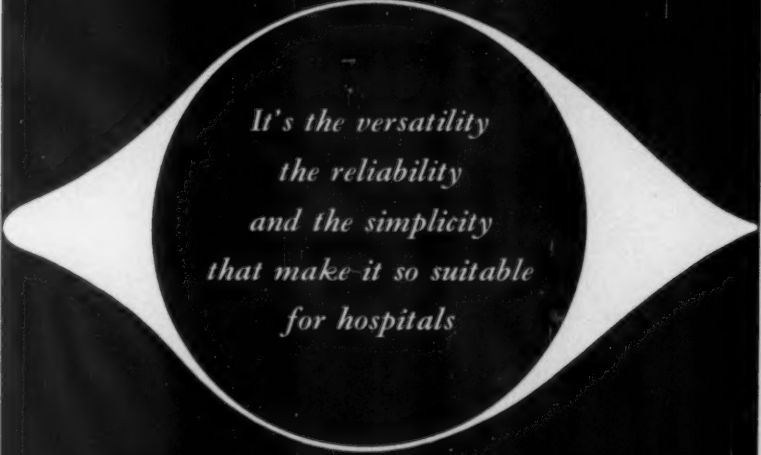
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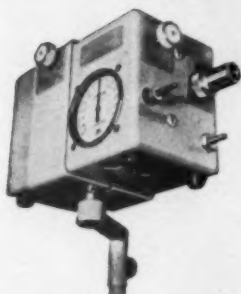
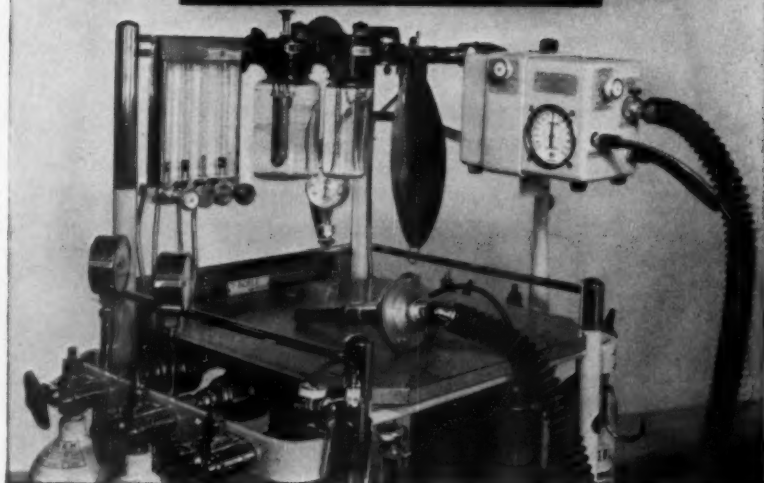
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RECTAL LYMPHOGRANULOMA VENEREUM IN JAMAICA

Hunterian Lecture delivered at the Royal College of Surgeons of England

on

6th September 1960

by

H. Annamunthodo, F.R.C.S., F.A.C.S.

Senior Lecturer in Surgery, University College of the West Indies, Jamaica

SOON AFTER THE opening of the University College Hospital of the West Indies in 1952, a study of the various aspects of lymphogranuloma venereum was undertaken by the Departments of Surgery, Gynaecology and Pathology in collaboration with the Venereal Disease Clinic of the Government of Jamaica and the Department of Virology of Miami University and supported by funds from the United States. It was my privilege to be one of the surgical members of the team engaged in this study and my remarks are based on the surgical material dealt with.

HISTORICAL

Lymph node affection by lymphogranuloma, the bubo, was known to the ancient Greeks, Romans and Arabs. Pisonis (1648) reported "Buba" among the conquistadores. John Hunter (1786) in the first description of the bubo in the English literature stated: "Buboes are slow in their cure and do not seem to be affected by mercury even when early applied".

Copeland (1814) in one of the earliest descriptions of the inflammatory rectal stricture suggested a venereal aetiology. Subsequently large series of "syphilitic" rectal strictures were reported (Larsen, 1849; Godebert, 1873; Fournier, 1875; Matthews, 1891; Reider, 1897; Jones, 1904; Ruge, 1907; Tuttle, 1911; Freidel, 1923; Rosser, 1925), each author stressing failure to improve on antisyphilitic therapy. How lively it would be had rectal strictures been commoner in England! John Hunter had differentiated the bubo from syphilis. Surely he would also have differentiated the rectal disease from syphilis! Inflammatory rectal strictures have also been attributed to gonorrhoea (Poelchen, 1892; Huber, 1897; Symonds, 1923; Hayes, 1931), chancroid (Koch, 1896) and tuberculosis (Huguier, 1849).

With Frei's description of a specific intradermal test in 1925 lymphogranuloma venereum was recognized as a disease entity. By the Frei test (Frei and Koppel, 1928), the complement fixation test (McKee *et al.*, 1940), identification of the virus in rectal discharge (Bensaude and Lambling, 1936) and reproduction of the disease in the experimental animal (Levaditi *et al.*, 1932), the common aetiology of the bubo and the majority of rectal strictures was established.

Rectal lymphogranuloma is a world-wide disease. It is well known in continental Europe. While the bubo was of common occurrence in the

British Navy (Goddard, 1896), the rectal disease was rare in Great Britain. Since World War II, however, rectal lymphogranuloma has been seen with increasing frequency in British hospitals.

AETIOLOGY

The virus of lymphogranuloma venereum belongs to the group of large viruses which includes the virus of trachoma and psittacosis. Infection is transmitted by venereal contact.

The classical concept of the disease is a fleeting primary lesion on the genitalia followed by a suppurative inflammatory reaction and subsequent fibrosis in the regional lymph nodes. The common clinical manifestations of the disease are: (i) acute inguinal adenitis (bubo) seen more frequently in males and (ii) subacute or chronic rectal disease which occurs more commonly in females. Other lesions often attributed to lymphogranuloma are genital elephantiasis, stenosis of the vagina and urethral stricture.

The mode of rectal infection is controversial. The paucity of inguinal adenitis in patients with the rectal disease is outstanding. The generally accepted view of a lymphatic spread from vagina or vulva is not supported by clinical or histological data.

The other popular theory is that of direct mucosal implantation. Rectal strictures have been produced in the experimental animal by implantation of the virus on the rectal mucosa (Levaditi *et al.*, 1932). A high incidence of homosexuals among male patients has been reported (Freidel, 1932; Bensaude and Lambling, 1936; Frei, 1938; Hanschell, 1938; Grace, 1943). Two of our 14 male patients confessed to sodomy. On the other hand, the majority of our female patients were multiparous and all denied rectal coitus. Rectal stricture has followed the use of infected enema nozzle (Grace and Henry, 1940).

It has been suggested that the anal canal may be infected from vaginal discharge (David and Lauer, 1932; Grace, 1943) or from spill around the anus during coitus (Miles, 1957).

Frequent scarring, often fistula formation, of the posterior vaginal wall and the rectovaginal septum at the level of the anorectal ring where rectum and vagina are in closest contact and the greater severity of rectal involvement at this site suggest the possibility of a contiguous spread of infection from the vagina without a suppurative process in the pararectal lymphatics.

Accidental infection has been reported in children who have shared beds with infected adults (Lujan and Rotter, 1932; Elitzak and Kornblith, 1935; Levy, 1937; Sonck, 1939). This was probably the mode of infection in the youngest of our female patients.

Liability of the negro to stricture formation has been suggested on the basis of a hypothetical fibroblastic diathesis (Rosser, 1925; Wright *et al.*, 1946). We have studied the disease in only one ethnic group. Our experience with other inflammatory gastrointestinal lesions does not support a fibroblastic diathesis of the intestinal tract of the negro.

RECTAL LYMPHOGRANULOMA VENEREUM IN JAMAICA

CLINICAL DATA

One hundred and forty-four patients with rectal lymphogranuloma venereum were treated at the University College of the West Indies from September 1952 to August 1958.

Two stages of the disease were recognized: (a) proctocolitis or subacute stage and (b) stricture or chronic stage.

All patients were of the lowest socio-economic group, and with one exception of negro descent. 90 per cent. of patients were females, the majority under 50 years of age (Table I). Patients with proctocolitis tend to be in a younger age group than those with stricture. Only 10 patients (7 per cent.) gave a history of acute inguinal adenitis at any time but did not associate this with genital infection.

TABLE I

AGE AND SEX OF PATIENTS WITH PROCTOCOLITIS AND RECTAL STRICTURES

Age in years	Proctocolitis		Rectal Strictures	
	M.	F.	M.	F.
10-14	0	0	0	1
15-19	1	1	0	0
20-24	0	2	0	6
25-29	1	5	0	13
30-34	1	4	1	15
35-39	0	8	4	14
40-49	1	5	2	38
Over 49	1	4	2	17
TOTAL	5	29	9	104

PROCTOCOLITIS

Thirty-four patients with proctocolitis were treated. Symptoms were those of a colitis with diarrhoea, passage of blood and mucus, tenesmus, rectal pain and loss of weight of three weeks' to 10 years' duration. Six patients complained of recurrent perianal abscesses and fistulae and two of acute polyarthritis. Patients were either afebrile or there was a low-grade fever with temperature up to 101° F. In patients with fever the symptoms were usually more severe.

In most cases there was left lower quadrant abdominal tenderness. The pelvic colon was thickened and tender. In 50 per cent. of cases there were oedematous anal skin tags. On digital examination, the rectal mucosa was granular and in some cases nodular. On sigmoidoscopy, this granularity might extend beyond 25 cm. from the anal margin, but the most marked and constant changes were at about 5 cm. The mucosa was oedematous and friable and bled easily and there were blood, pus and mucus in the lumen.

Investigations

The majority of patients were anaemic and in 20 per cent. the haemoglobin value was less than 8 G. per 100 ml. In 25 per cent. of patients there was a mild leucocytosis of 8,000 to 10,000 per c.mm. Total serum proteins were elevated.

The lymphogranuloma venereum complement fixation test was positive in all cases, usually in a titre of 1 : 160 or higher.

Barium studies. Loss of haustration and mucosal pattern and spasm were characteristic, the features of any colitis. The radiological changes



Fig. 1. X-ray of patient with proctocolitis. The transverse colon is most severely affected.

may be most marked in certain areas of the colon, but usually the whole colon and rectum were affected (Fig. 1).

Treatment

All patients were admitted to hospital and were put on a low residue diet, bed rest and non-specific supportive therapy.

Thirty-two patients were treated with antibiotics or sulphonamides in doses of 2 G. daily for at least 14 days. Five antibiotics (chloramphenicol, erythromycin, tetracycline, chlortetracycline and streptomycin) and two sulphonamides (sulphathiazole and sulphadimidine) were used. The choice of drug was on a basis of trial and error. Seven patients who did not improve on one drug were given a second course of a different drug. Two patients received no specific therapy.

RECTAL LYMPHOGRANULOMA VENEREUM IN JAMAICA

Results (Table II)

TABLE II
RESULTS OF TREATMENT OF 34 PATIENTS WITH PROCTOCOLITIS

Treatment	No. of Cases	Results		
		Good	Poor	Defaulted
Antibiotics and sulphonamides	32	21	2	9
No drugs	2	1	1	—

In 22 patients improvement was dramatic and was maintained for six months to five years. Symptoms were completely relieved and on sigmoidoscopy the colon and rectum were normal. Nine patients defaulted in attendance within six months; eight of these were free of symptoms when last seen.

It is of interest to try to determine the cause of failure in the three cases which progressed to stricture formation. All three patients were females.

Case 1. History of untreated proctocolitis for 10 years. L.G.V.C.F.T. titre 1 : 160. Patient defaulted after receiving only 17 G. of chlortetracycline. Six months later an anorectal stricture with secondary infection was present and the L.G.V.C.F.T. titre was 1 : 160. Failure was probably due to inadequate treatment and underlying fibrosis from prolonged infection leading to an inevitable stricture.

Case 2. History of proctocolitis for two-and-a-half-years. L.G.V.C.F.T. titre 1 : 80. There was no improvement after 24 G. chlortetracycline. After 6 G. streptomycin symptoms were relieved but the patient defaulted in attendance. Three months later there was still evidence of a mild proctocolitis and the L.G.V.C.F.T. was negative. One year later an anorectal stricture and a small rectovaginal fistula were present. Failure was probably due to inadequate treatment.

Case 3. History of proctocolitis for 18 months. L.G.V.C.F.T. titre 1 : 640. She was treated by bed rest only and symptoms were completely relieved. Two years later an anorectal stricture was present and the L.G.V.C.F.T. titre was 1 : 160. She improved with chlortetracycline 28 G. In the presence of a high complement fixation titre it was probably unwise to withhold antibiotics in this case.

The apparent complete resolution of proctocolitis after a variety of drugs, even after erythromycin and streptomycin which are ineffective in the treatment of the bubo, indicates that symptoms are largely due to non-specific secondary infection, and that response to treatment depends more on the effect of the drug on secondary infection than on its virucidal action. The majority of patients were treated with tetracycline and good results are probably due to the broad spectrum of activity of this antibiotic. The role of persistent secondary infection in the production of the fibrous stricture has not been assessed.

STRICTURES

One hundred and thirteen patients with rectal strictures were treated. Among these were the three cases of proctocolitis mentioned.

Duration of symptoms varied from six months to 10 years and was not related to the severity of the disease. Symptoms were those of a chronic

H. ANNAMUNTHODO

low large gut obstruction with or without associated rectal and pararectal infection (Table III). Two patients were admitted with acute intestinal obstruction.

TABLE III
MAIN SYMPTOMS IN 113 PATIENTS WITH RECTAL STRICTURES

<i>Main Symptoms</i>	<i>Number of Cases</i>
Constipation, straining at defaecation and passage of "pencil stool"	90
Passage of blood, mucus and pus on defaecation	90
Lower abdominal pain	45
Loss of weight	39
Diarrhoea	24
Rectal pain and tenesmus	24
Vaginal discharge	23
Passage of faeces <i>per vaginam</i>	20
Perineal fistulae and abscesses	11
Incontinence of faeces	4



Fig. 2. Indurated anal tags (lymphorrhoids) in patient with rectal stricture.

Thirty-nine patients had a low-grade fever with temperature up to 101° F. and three of 103° F.; these patients had a profuse rectal discharge or infected anal fistulae. The others were afebrile. Eleven patients showed signs of gross nutritional disturbance.

Perianal granulomata and indurated anal tags were present in 64 patients (Fig. 2) and anal fistulae in 26 (Fig. 3). In 34 patients a low rectovaginal fistula was demonstrated; in 20 this was large, admitting the

RECTAL LYMPHOGRANULOMA VENEREUM IN JAMAICA

index finger. In one case the perineum and lower one-third of rectovaginal septum had been destroyed with formation of a cloaca. Elephantiasis of the vulva was present in nine patients, all of whom had a rectovaginal fistula (Fig. 4). In two cases the floor of the urethra was destroyed (Table IV).

In every case a fibrous stricture was palpated. In 107 cases it was present at 3 to 5 cm. from the anal margin and in all cases within 13 cm. The surface of the stricture was usually irregular, but often it was smooth.



Fig. 3. "Watering can" fistulae in patient with rectal stricture.

Sigmoidoscopy was attempted in every case. In some the instrument could be passed only after stricture dilatation. In others the stricture could not be dilated sufficiently to permit the examination.

Investigations

Blood. 85 per cent. of patients were anaemic and in 20 per cent. the haemoglobin value was less than 8 G. per 100 ml.

In 20 per cent. of patients there was a mild leucocytosis, the leucocyte count in no case being above 15,000 per c.mm. In three patients there was a lymphocytosis of 50 to 60 per cent.

Blood serum. Total serum proteins were elevated. From an analysis of the serum proteins in patients with acute disease (bubo), subacute disease (proctocolitis) and chronic disease (stricture) it appears that the

first abnormality is an increase in the synthesis of gamma globin followed after an interval by a decrease in the albumins. This confirms the observations of Gutman *et al.* (1936), Jersild (1937) and Howard *et al.* (1939).

Serology. The gonococcal complement fixation test was positive in 50 per cent. and the V.D.R.L. in 25 per cent. of all cases of rectal lymphogranuloma, but in no case was there any clinical evidence of gonorrhoea or syphilis.

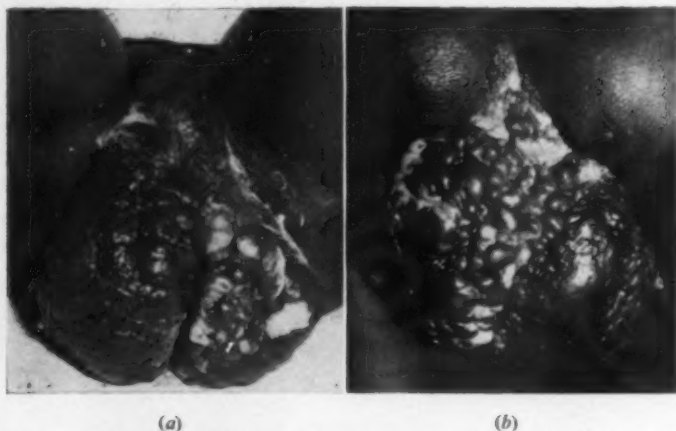


Fig. 4. Elephantiasis of vulva and perianal granuloma in patient with rectal stricture and rectovaginal fistula: (a) view in lithotomy position; (b) view from behind.

TABLE IV

FINDINGS ON PERINEAL EXAMINATION IN 104 FEMALES WITH RECTAL STRICTURES

Perineal Findings	Number of Cases
Perianal granulomata and indurated tags ..	64
Scarring of rectovaginal septum without fistula formation	39
Rectovaginal fistulae	34
Perianal sinuses, fistulae and abscesses	26
Elephantiasis of vulva	9
Ulceration of labia and vagina	3
Urethrovaginal fistulae	2
Urethral stricture	2
Urethral granuloma	1
Destruction of perineum	1

At the University College Hospital we have preferred the complement fixation test to the Frei test because it is more reliable and more sensitive and because it is a quantitative test. In 75 per cent. of cases the L.G.V.C.F.T. was positive in a titre of 1 : 160 or higher (Table V). In ten cases it was persistently negative or anticomplementary. Nevertheless,

RECTAL LYMPHOGRANULOMA VENEREUM IN JAMAICA

the clinical and pathological picture in these cases was indistinguishable from the others. A negative response to the intradermal test in patients suffering from the disease has been explained on the basis of "anergy" (King, 1960).

TABLE V

COMPLEMENT FIXATION TITRES IN PATIENTS WITH BUBOES AND RECTAL LYMPHOGRANULOMA VENEREUM TREATED AT THE UNIVERSITY COLLEGE HOSPITAL, JAMAICA

Titre	Buboes	Proctocolitis	Rectal Strictures
	%	%	%
1 : 40	34	18	19
1 : 80	18	9	5
1 : 160	18	29	21
1 : 320	6	9	6
1 : 640	21	23	27
1 : 1280	3	12	7
1 : 2560	0	0	2
1 : 5120	0	0	3
Anticomplementary	0	0	5
Negative	0	0	5

In the individual case, the complement fixation titre was no index of the severity of the disease. Nor was it of much value in assessing the effect of treatment. While in the acute disease the L.G.V.C.F.T. could nearly always be reversed to negative, rarely was the titre appreciably lowered in the rectal cases which improved on treatment. Goldberg and Banov (1956) reported similar experience and concluded that the strongly positive results to the complement fixation test were not necessarily indicative of active infection.

Barium studies

Strictures were demonstrated at the anorectal level. Dilatation and loss of haustration of the gut above the stricture was present in most cases. The length of gut involved varied from a short stricture of 2 to 3 cm. to a long tubular obliteration of the rectum and sigmoid colon. In the latter cases the sigmoid colon was greatly contracted and the rectosigmoid angle obliterated. Where the lumen was greatly obliterated the radiological picture was similar to that of the "string" stricture of regional colitis. In these cases adequate barium examination was obtained by introducing barium via the distal loop of a colostomy.

Pararectal sinuses are often demonstrated in relation to the stricture or the gut just below it. These sinuses may be short and diverticular in appearance or long irregular tracts passing beside the rectum towards the perianal skin. Sinuses may communicate with large pararectal abscess cavities. Rectovaginal fistulae are best visualized on an oblique or lateral view. With a large rectovaginal fistula barium spills over into the vagina and it may be difficult to obtain good colonic filling.

Multiple strictures with apparently normal intervening gut similar to the "skip" area of regional colitis are occasionally encountered. In ten cases (9 per cent.) there was suprarectal involvement either by a long tubular stricture extending from the rectum into the colon or by a localized colonic stricture.

The common X-ray findings are seen in Figures 5 to 9.

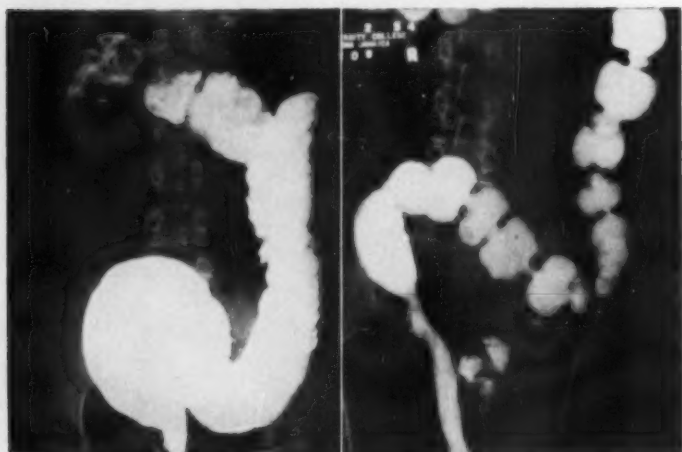


Fig. 5 (left). X-ray showing tubular stricture of rectum with multiple pararectal sinuses and dilatation of colon.

Fig. 6 (right). X-ray showing long tubular stricture of rectum with an irregular pararectal abscess cavity.

Pathological anatomy

The stricture most commonly is tubular involving 5 to 20 cm. of the rectum and sigmoid colon (Fig. 10). There is often an abrupt demarcation line with the non-involved part of the bowel. The lumen is often as small as 6 mm. in diameter. The wall of the rectum is thickened and rigid. The mucosa may be ulcerated, roughened and polypoid. The bowel proximal to the stricture is usually dilated and stercoral ulcers are often present. The pararectal tissues usually show gross fibrosis. Fistulae are frequently seen. Perianal excrescences either smooth (lymphorrhoids) or granulomatous and warty are common.

Histology

Often large areas of mucosa are replaced by granulomatous tissue with varying amounts of haemorrhage and non-specific exudate. Giant cells of the foreign body type are rarely seen.

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The submucosa and muscularis are markedly thickened with fibrosis and non-specific infiltration with plasma cells, lymphocytes, histiocytes and occasional eosinophils. Secondary lymph follicle formations are seen and nerve tissue is frequently prominent. The vessels often show an obliterating endarteritis. Perivascular lymphatics are often dilated. Sinuses when present are occasionally lined with squamous epithelium and surrounded by non-specific acute and chronic inflammatory reaction with fibrosis.

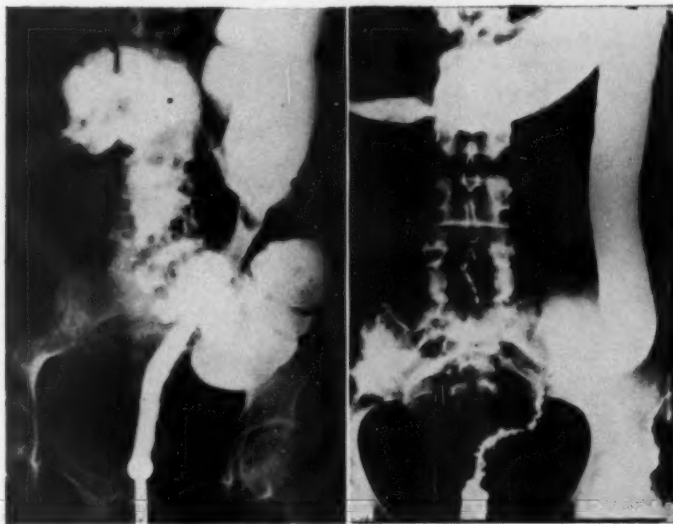


Fig. 7 (left). X-ray showing tubular stricture of rectum, sigmoid and descending colon. The colon is contracted and the rectosigmoid angle obliterated.

Fig. 8 (right). X-ray showing "beaded" stricture of rectum and sigmoid colon. Barium introduced via distal loop of transverse colostomy.

The histology is non-specific. Crook (1957) mentions the similarity of regional colitis, ulcerative colitis and lymphogranuloma venereum. In the late stages these diseases are almost indistinguishable histologically. Bras (1960) states: "The contribution of the histologist towards diagnosis of lymphogranuloma is usually small. His findings are of importance to rule out other processes and complicating conditions such as malignant disease."

Treatment and results (Table VI)

The problems are those of obstruction and infection, rectal and para-rectal. Spontaneous resolution of a fibrous stricture never occurs, but a

patient with a moderate stricture may be rendered free of symptoms if infection is controlled.

Assessment of results is based on symptomatic improvement and on the clinical and sigmoidoscopic findings. When the patient has been completely free of symptoms and is clinically free of the disease, that is, the stricture has been excised, the result is assessed as good. When symptoms have been relieved and general health improved but a stricture is still



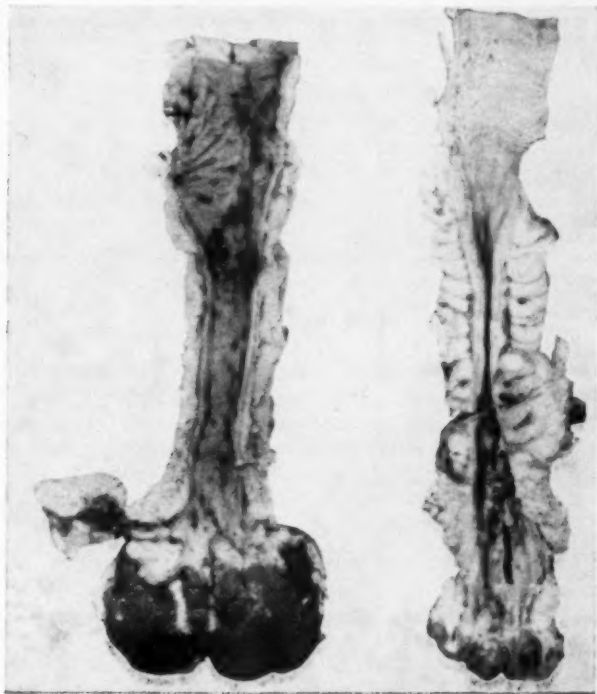
Fig. 9. X-ray showing anorectal, rectosigmoid and descending colonic strictures.

present or some disability follows treatment, for example, a permanent colostomy or stress incontinence, the result is assessed as moderately good. When the more severe symptoms have persisted or considerable disability has followed treatment, for example, anal incontinence or a tight anal stricture, the result is assessed as poor. The patient is the best judge of the success or failure of treatment.

Antibiotics and sulphonamides—41 cases. Forty-one patients with short strictures and symptoms due mainly to infection were treated as cases

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of proctocolitis. In the majority there was immediate improvement, but five patients required two courses of drugs. Twenty have remained free of symptoms from six months to five years; 15 have not been followed up. Six patients were not improved, but have not so far accepted the alternative, that is, operation.



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Fig. 10. Two specimens removed at abdomino-perineal excision showing tubular stricture, mucosal ulceration, rectovaginal fistula and perianal granuloma.

Dilatation—13 cases. Thirteen cases were treated by intermittent dilatation by gum elastic bougies under direct vision on the first occasion followed by digital dilatation at increasing intervals. In two cases, perforation of the rectum occurred during digital and bougie dilatation respectively necessitating an emergency colostomy. Eleven patients have improved.

Dilatation is effective only in very few selected cases, the soft short stricture. It should not be attempted for strictures extending above the

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peritoneal reflection or in the presence of gross infection and should be abandoned if the stricture splits easily or if bleeding occurs. In these few cases there was no evidence that dilatation increased the tendency to fibrosis (Patterson, 1941).

TABLE VI
RESULTS OF TREATMENT OF 113 PATIENTS WITH RECTAL STRICTURES

Treatment	No. of Cases	Results				
		Good	Moderately Good	Poor	Deaths	Defaulted
Antibiotics and sulphonamides	41	—	20	6	—	15
Dilatation	10	—	9	—	—	1
Permanent colostomy ..	6	—	5	—	1	—
Permanent colostomy for perforated rectum ..	1	—	1	—	—	—
Abdomino-perineal excision ..	9	—	9	—	—	—
A.P. excision for perforated rectum	1	—	1	—	—	—
Pull-through operations:						
Pauchet's operation ..	10	—	2	6	2	—
Posterior sphincter division	2	1	—	1	—	—
Anterior sphincter division	4	—	2	2	—	—
Wallis's operation ..	8	4	4	—	—	—
Colonic resection and Wallis's operation ..	1	—	1	—	—	—
Colonic resection and dilatation ..	1	—	1	—	—	—
Sacroperineal proctectomy ..	2	1	1	—	—	—
Pauchet's operation after sacroperineal proctectomy	1	—	—	1	—	—
Excision of rectovaginal fistula	1	—	1	—	—	—
Excision of anal fistulae ..	3	—	3	—	—	—
Internal proctotomy ..	1	—	1	—	—	—
Vulvectomy	2	—	2	—	—	—
Suprapubic cystostomy ..	1	—	—	—	1	—
Refused treatment ..	3	—	—	—	—	—
No treatment necessary ..	5	—	—	—	—	—

Indications for operation. We have used the following indications for operation:

(a) The impassable rectal stricture producing obstructive symptoms. A short stricture which admits the index finger easily should not require a major operation. A tight stricture may produce acute intestinal obstruction necessitating urgent operation.

(b) Persistent rectovaginal or anal fistulae.

(c) Persistent ill-health due to rectal or pararectal infection which has failed to improve with antibiotics and sulphonamides.

(d) Gross destruction of the anal canal, anal sphincter and perineum. In these cases, restoration of sphincter control is impossible.

Pre-operative treatment. All patients treated by operation were given pre- and post-operative courses of antibiotics and sulphonamides, the

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drugs and dosage varying from case to case depending on the severity of infection. In no case was an excision operation performed until secondary infection was controlled. Nutritional disturbance, dehydration and anaemia were corrected pre-operatively.

Permanent colostomy—seven cases. Seven patients were treated by a permanent defunctioning colostomy, either left iliac (five cases) or transverse (two cases). A more radical procedure was contraindicated because of concomitant disease or because the patient refused further treatment. All colostomies were placed well above the diseased bowel.

Results: One patient died of pulmonary embolism on the third post-operative day. The general health of the other patients improved and there has been no evidence of reactivation of the disease up to six years later. In no case did the disease spread into the colostomy stoma (Patterson, 1941).

Permanent colostomy is a major inconvenience in patients with a low standard of education, living in over-crowded conditions, with little privacy for toilet and with no means of obtaining the requisites for colostomy care.

Excision operations. As in ulcerative colitis an excision operation is to be preferred to simple diversion provided the patient can withstand the more severe procedure. There has been no case of carcinoma complicating rectal lymphogranuloma among our patients, but several cases have been reported in the literature (Hartmann, 1922; Liccione, 1936; Barber and Murphy, 1941; Guzman, 1943; Woods and Hanlon, 1944; Wright *et al.*, 1946; White and Miller, 1953; Rainey, 1954).

(a) Abdomino-perineal excision—ten cases. Abdomino-perineal excision of the rectum was performed in ten patients. In these, the stricture was extensive and the sphincter appeared to be irrecoverably damaged. In five, there was a large rectovaginal fistula and in one the perineum and lower part of the rectovaginal septum were destroyed. In eight patients the operation was performed in two stages and in two in one stage.

Abdomino-perineal excision of the rectum is a more difficult operation for the inflammatory stricture than it is for the operable cancer. Invariably there are multiple pelvic adhesions and contraction and scarring of the pelvic peritoneum and tissue planes are obliterated.

Results: The general health of these patients has improved and there has been no evidence of residual infection in a follow-up of over three years.

(b) Pull-through operations. Experience with three procedures.

The ideal operation for a non-malignant disease is one which restores normal function. It was hoped that a sphincter preserving pull-through proctectomy would give good functional control.

Procedure One—11 cases. Wright *et al.* (1946) reported good results from treatment by proctectomy by the operation described by Pauchet (1925). This operation was performed in 11 patients in two stages, the first stage being a transverse colostomy.

Results: There were two post-operative deaths. Seven patients either developed a tight stricture at the mucocutaneous junction or did not regain sphincter control. In no case was normal sphincter function restored.

Procedure Two—six cases. Poor results from the Pauchet operation were attributed to dissection and reflection of an already fibrosed external sphincter. An attempt was made to improve these results by conserving the sphincter in six cases. The sphincter was divided in the midline anteriorly or posteriorly and an intra-sphincteric mobilization of the rectum performed, the sphincter being repaired over the protruding gut at the end of the operation.

Results were only slightly improved. In only one case was normal sphincter control obtained.

Procedure Three—nine cases. Wallis (1900) described a technique of intra-sphincteric proctectomy without division or reflection of the sphincter. Dimitriu and Gregoresco (1933) described an "abdomino-endo-anal" procedure which is essentially Wallis's operation facilitated by transabdominal mobilization of the colon. An attempt was made to improve the sphincter mechanism by this operation in nine patients. The dissection was extremely difficult, the rectum and anal canal often being removed in several pieces.

Results: In four patients, normal sphincter function was restored. In five, there was normal rectal sensation but some degree of stress incontinence has persisted. The latter patients, by regulating their bowel habits, are leading a normal life.

(c) *Sacroperineal proctectomy—three cases.* Breidenbach and Slattery (1948) performed sacroperineal proctectomy and anastomosis (Kráské's operation) with success not obtained by others (Barber and Murphy, 1941). This operation and anterior resection of the rectum will be possible in only very few cases, the short localized stricture with very little pararectal fibrosis and a normal sphincter. Sacroperineal proctectomy was performed in three cases.

Results: Normal sphincter control was restored in only one case.

Other operations. Two patients were treated by resection of strictures of the splenic flexure and descending colon followed by a pull-through operation in one case and stricture dilatation in the other. One patient was successfully treated by internal proctotomy.

One patient was admitted *in extremis* with acute retention of urine and died within 24 hours of performance of a suprapubic cystotomy.

Complications

Anal fistulae. Anal fistulae will usually heal after control of infection by antibiotics or after a colostomy. Persistent multiple fistulae are an indication for operation on the stricture. A persistent single fistula has been successfully excised in three cases.

Rectovaginal fistula. Usually we have not attempted to treat a rectovaginal fistula *per se*. The fistula is excised in all extirpative operations. In one case with a moderate stricture the fistula was excised successfully. One case with a moderate stricture, a large rectovaginal fistula and vulval elephantiasis, was treated with antibiotics and vulvectomy; rectal symptoms were completely relieved and the rectovaginal fistula closed spontaneously within six months. This was unexpected, and now a rectovaginal fistula is regarded as an indication for operation only after a period of observation.

CONCLUSIONS

Lymphogranuloma venereum is a major public health problem in Jamaica. With improvement in the standard of living, better housing, better general education, a healthier sex education, and a more active programme of venereal disease control, the incidence of rectal lymphogranuloma should diminish.

The early diagnosis and treatment of the proctocolitis by drugs is effective and should reduce the incidence of stricture.

Major operations should be reserved for cases in which the more conservative methods of treatment are unlikely to succeed or have failed. At present, in Jamaica, operation necessitating a permanent colostomy should be considered more carefully than in this country. Unfortunately our attempts to eradicate the disease by operation and leave the patient with a functioning anus have been attended with only very limited success. Some of the failures may be attributed to insufficient experience with these operations, but involvement of the sphincter in the dense fibrotic process is probably responsible for the majority. In these fibrotic sphincters functional control is impossible. In a small number of cases intra-sphincteric proctectomy in one stage by the method described by Dimitriu and Gregoresco (1933) has given promising results where the sphincter is free.

The disease appears to be self-limiting. There has been no evidence of reactivation after removal of the affected gut even though this is rarely a complete *en bloc* excision or indeed even after a colostomy only.

Our follow-up has been short. I have deliberately avoided the term "cure" because rarely has the complement fixation reaction been reversed to negative. The significance of a persistently positive serological reaction in the absence of clinical evidence of disease is yet to be assessed.

We have come a long way since John Hunter described the bubo 175 years ago and Frei placed the study of the disease on a firm aetiological basis 140 years later. In the past 35 years our knowledge of the lympho-

granuloma venereum virus has increased, but the problem of treatment of the rectal stricture, the most disabling complication of the disease, awaits solution. Morter (1933) stated: "The study of the stricture of the rectum is as fascinating as the treatment is discouraging." In 1960 we can say: "Treatment of the rectal stricture is often disappointing, but the results are encouraging."

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GRANT OF DIPLOMAS TO FELLOWS IN THE FACULTY OF ANAESTHETISTS

AT THE FINAL EXAMINATION for the Fellowship in the Faculty of Anaesthetists held in July, 44 candidates out of 135 were successful.

At the meeting of Council on 3rd August, Diplomas of Fellowship in the Faculty of Anaesthetists were granted to the following:

- GRAHAM, Reginald Edgar (*Glasgow*).
ROBERTS, Robert Bryan (*King's College*).
WRITER, William Desmond Russell (*Liverpool*).
KABIR, Syed Ahmed (*Madras*).
COCHRAN, Ian McIntosh (*Aberdeen*).
COOKE, Barbara Way (*Durham*).
GIBSON, Robert Ernest Craig (*Glasgow*).
ALLISON, Jean Marie (*Melbourne*).
FRIENDSHIP, Colin James (*Sydney*).
GARDINER, Alan Seath (*Charing Cross*).
PIRIE, Bruce Geddes (*Aberdeen*).
KAMINER, Mendel (*Witwatersrand*).
LLOYD, Charles Geoffrey (*Birmingham*).
STEELE, Robert Ernest (*Adelaide*).
BODLEY, Peter Owen (*The London*).
McKENZIE, Ray (*New Zealand*).
MACNAB, Graham William (*Glasgow*).
SEELYE, Eva Ruth (*New Zealand*).
BURN, James Mervyn Barnett (*Bristol*).
BUTLER, Robert Anthony (*Manchester*).
CHANDRA, Phool (*Lucknow*).
DAVIE, John Paterson (*Edinburgh*).
MA, Shu Poh (*Rangoon*).
MURRAY, Niall Patrick (*National University of Ireland*).
VOYSEY, Margaret Mary (*St. Bartholomew's*).
JEPSON, Bridget Alison (*St. Bartholomew's*).
LUTCHMAN, Stanley Sivsundar (*West Indies*).
MAXWELL, Donald Charles (*Sydney*).
ORMSTON, Thomas Ormston Grundy (*Edinburgh*).
PAYMASTER, Nalin Jagmohandas (*Bombay*).
FADL, El Tahir (*Khartoum*).
GANENDRAN, Arumugam (*Bristol*).
GILLET, George Bryan (*St. Bartholomew's*).
JENNINGS, Alan Maurice Charles (*Leeds*).
SCHROEDER, Harry Glynne (*Birmingham*).
BLAND, John Hopkyn Lloyd (*University College*).
DREOSTI, Aldo Victor (*Witwatersrand*).
FOSTER, Bruce (*University College*).
HART, Seamus Murray (*Dublin*).
NIGHTINGALE, David Anthony (*The London*).
O'DONNELL, James Francis (*Dublin*).
WALDRON, Bryan le Gros (*St. Bartholomew's*).

SIR THOMAS DUNHILL

The first Dunhill Memorial Lecture delivered at the International Goitre Conference
in London
on
6th July 1960
by

Sir Geoffrey Keynes,
M.D., D.Litt., LL.D., F.R.C.P., F.R.C.S., F.R.C.O.G.



Fig. 1. Sir Thomas Dunhill, G.C.V.O., C.M.G., M.D., F.R.C.S.,
F.R.A.C.S

I HAVE BEEN greatly honoured by the invitation to deliver at this International Congress the first Dunhill Memorial Lecture. The name of Sir Thomas Dunhill arouses in my mind memories of so many exciting episodes in my surgical life that it is hard to avoid over-indulgence in reminiscence and anecdote concerning that remarkable man. In the course of twenty years of close association with Dunhill, I learnt far more from him than from any other man. It is possible that my admiration for his qualities both as a surgeon and as a human being may lead me into an exaggerated estimate of his influence on contemporary surgery, but I think this is unlikely.

SIR THOMAS DUNHILL

My main theme to-day must be to put before you the facts concerning Dunhill's position in the history of the treatment of thyroid disease, particularly that part of it known variously as exophthalmic goitre, Graves's disease, von Basedow's disease, or toxic goitre. During the last fifty years the surgery of the thyroid gland has undergone a series of profound changes, and for the earlier phases Dunhill carried more responsibility than any other individual.

Thomas Peel Dunhill was born at Tragowel, Victoria, Australia, on 3rd December 1876, and died soon after his 81st birthday in 1957. He began his career with no material advantages, and spent several years after leaving school as assistant in a chemist's shop, so that he might be able to pay for a medical education. He qualified in 1903, aged 27. He then worked for two years as house surgeon to Sir Henry Maudsley at the Royal Melbourne Hospital and after another two years was appointed to the staff of St. Vincent's Hospital, Melbourne. By 1907, therefore, he was in a position to start in private practice as a surgeon in Collins Street. Already as a house surgeon he had interested himself in disease of the thyroid gland, and had practised the operation of thyroidectomy in goats—partly in order that he might treat patients suffering from exophthalmic goitre with the milk of thyroidectomized animals.

Dunhill had observed as a dresser that his chief applied to the surgery of the thyroid gland the technique of the dissecting room with scalpel and forceps, and that a very messy operation resulted. He had also noted that chloroform used as an anaesthetic for toxic patients led to a high rate of mortality. In 1907, therefore, as soon as he had become a free agent, he decided to use a different technique and to abandon chloroform as an anaesthetic. He had been impressed by the miseries endured by toxic patients and by "the staring disfigurement", as he called it, produced by their disease. He had also formed the opinion that the high mortality following surgery was partly due to the fact that the patients were treated medically until they were literally unfit for any form of general anaesthesia. He therefore operated on his first patient with exophthalmic goitre in 1907 under local analgesia with eucaïne as described by Barker in *The Practitioner* earlier that year; he used his finger rather than a scalpel in separating natural fascial planes, so that the main blood vessels could be isolated and ligatured. In this way he ensured a relatively bloodless field and initiated the masterly technique in thyroid surgery for which he became so famous in later years.

Dunhill's first thyroid patient was a cook who had become so ill and miserable that she was anxious to undergo any risk rather than continue as she was. The operation was a success, and six more patients were submitted to operation during the next few months. Dunhill reported on these in a paper in the *Intercolonial Medical Journal of Australasia* in

November 1907, and this communication should be regarded as the historical starting point in the surgery of toxic goitre. A second paper followed in 1908, when Dunhill had operated on 32 patients with only a single death, this being the thirteenth patient in the series, as he noted for the benefit of superstitious persons.

Perusal of these two papers reveals to those of us who came afterwards the extraordinary rapidity and precision with which Dunhill's mind seized on the essential points for success in thyroid surgery.

Harley in 1905 had reported on 15 operations, and Kocher had published some results in 1906, but their mortality was high and results were unsatisfactory. "Cure" was being claimed by surgeons, including Kocher and Charles Mayo, after removal of one lobe of the thyroid gland; but it was almost immediately plain to Dunhill that a hemithyroidectomy was, in fact, quite inadequate. At first he practised a two-stage operation, removing one lobe at the first operation and a large portion of the second lobe on a later occasion, the patient's condition having improved in the meantime. Then, as he afterwards recalled, he spent an anxious night discussing with his brother and another medical colleague, while pacing up and down Collins Street, the question of whether it would be justifiable to complete the subtotal thyroidectomy at one operation. They concluded that it would be right to do so and from that time, although multiple-stage operations were still occasionally necessary, Dunhill's standard operation was an extensive resection of both lobes. It was not until four years later, in 1912, that Halsted described a similar operation in the United States. Cecil Joll, after a careful examination of the literature, told Dunhill in 1929 that he was quite certainly the first to advocate this extensive thyroidectomy, though Halsted had quite failed to appreciate Dunhill's claim to priority in his review of the position in 1912.

It is remarkable that already in 1908 Dunhill had considered the question of the patient with advanced disease of the heart. He had operated on two such patients using his new technique of a quick, but gentle, operation under the analgesia produced by local injection of Barker's solution of eucaïne and adrenaline. His incision was the "collar incision" introduced by Kocher, and he had shown that division of the infrahyoid muscles was usually unnecessary. He was delighted that these patients, previously known as "the derelicts of the hospitals", could now have a good hope of being restored to normal life. "I will now", he declared, "scarcely regard any case as being too advanced to stand operation or too ill to be benefited by operation", provided, that is, that local analgesia was used. The general pattern of Dunhill's thyroid practice was set thus early in his surgical career. In May 1909 he reported in the *British Medical Journal* on the results of 113 operations performed in 20 months. Osler had believed that every patient should be treated medically

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for three months before operation was contemplated, and Dunhill endorsed this to the extent of saying that medical treatment should always be pursued until it was plain that no improvement was being obtained, but that no patient should be permitted to start the course of rapid deterioration (the "slide" as he called it) seen so often in the past. His 113 operations had included 88 patients with either "exophthalmic goitre" or with "thyrotoxicosis", the name he now proposed to use for the condition in those patients with severe symptoms but little or no exophthalmos. He had not had another death since that of the thirteenth patient already mentioned.



(Reproduced by permission)

Fig. 2. First impression of Sir Thomas Dunhill by Mr. James Gunn, R.A.

In November 1910, Dunhill recalled how he had formerly been feeding patients with the milk of thyroidectomized goats, but now operated even on patients with symptoms of advanced heart failure. He had already operated on 19 patients in this state, but still did not have to report more than three deaths among 199 thyrotoxic patients.

About the same time Sir Hector Mackenzie had reported that of 13 of his patients operated on in London five had improved, three were unchanged, and five had died—a sufficiently striking contrast with the results obtained in Australia. At this date (1910) Dunhill confessed that he had not seen any parathyroid glands, but on the other hand none of his patients had ever had signs of tetany.

It seems that by this time Dunhill thought he had written enough to make his position and his reasons for his practice clear and he published no further papers for a few years; but in 1917 he was moved to write again, though he was now serving with the army in France. McCarrison was still maintaining that Graves's disease is not essentially due to thyroid gland activity and that, therefore, surgical treatment was therapeutically wrong and practically useless. Any improvement obtained was, he said, due to rest in bed. Dunhill pleaded gently in reply that minds should be kept open. He had by now performed 1,500 thyroid operations, of which more than half were in patients with Graves's disease or thyrotoxicosis. He illustrated among these examples of the extreme emaciation such as can scarcely be believed by surgeons at the present time, accustomed to see only patients who have been treated by antithyroid drugs. He illustrated also patients with a condition which we still sometimes see and call "malignant exophthalmos", exhibiting gross oedema of the conjunctiva. He had even reluctantly operated on two patients as a "last resort", a practice condemned by him seven years before. Nevertheless, his mortality rate had remained in the neighbourhood of 1.5 per cent. McCarrison, he said, was declaring that it was useless to swell the literature with reports of patients supposed "cured" without the fullest information concerning each case. Dunhill claimed that he had given this information, whereas he had searched McCarrison's book and could find only one case in which details were supplied from his own experience.

At this time Dunhill was giving some attention to the question of the influence of sepsis in the production of Graves's disease, or in worsening the symptoms. He was disposed to think it was a minor factor, but should not be altogether neglected, as when, for instance, there were obviously infected tonsils. But he related as an object lesson the story of one of his patients who had been under the care of a so-called "goitre specialist". This girl had first had a tonsillectomy done. The operation was then repeated for enucleation of the tonsils. The third operation was for correction of a deflected nasal septum. The fourth was for clearing out the accessory sinuses. X-ray treatment was then given, and finally nearly all her teeth were to be extracted. At this point she was seen by Dunhill and a thyroidectomy immediately gave the relief of symptoms she had so long been seeking.

Dunhill had from the start in 1907 been very sure of his ground, but for many years his views met with much opposition. In 1921, Dr. Leonard Williams had stated that the thyroid gland had no more to do with Graves's disease than the kidneys with diabetes. He believed that the proptosis was due to the adrenals and the heart condition to the thymus. In later years Dunhill recalled that during his first visit to Great Britain he was told by one neighbour at a dinner: "It is quite certain that your cases of exophthalmic goitre are much less severe than those in England."

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The neighbour on his other side did not speak at all while they were having their soup. Towards the end of the fish course this neighbour found himself able to say: "I am driven to the conclusion that surgeons are not candid in the statements they publish." In the United States a surgeon was unable to believe that bilateral resection of the thyroid for Graves's disease had been done in Australia. Such is fame!

Dunhill had some rather bitter things to say about medical opinion. I have already referred to his quick appreciation of the extraordinary value of surgery when the patient had reached the stage of cardiac irregularity, or "auricular fibrillation" as it afterwards came to be called. Dunhill found that cardiologists were very slow to be convinced that operation was safe in the presence of this complication and even of congestive heart failure. He stated that he knew—for he had proved it—that it takes 10 years to convert a physician and some never are converted. He had also come to know that to a physician a surgeon is a surgeon, and that's that! At the same time he admitted that physicians sometimes had some justification for their attitude. Dr. Theodore Thompson had submitted four toxic patients to surgery in 1923; all four had died and he was in consequence still treating all his toxic patients medically five years later. Some surgeons had, in fact, themselves not grasped the principles upon which Dunhill's attainment of surgical safety were based.

I should nevertheless make it quite plain that Dunhill's relations with his immediate medical colleagues were always most happy. His fruitful co-operation with Professor Sir Francis Fraser over many years at St. Bartholomew's Hospital is a matter of history. Dunhill's view of this relationship is vividly pictured in his plea for safety for ever closer cooperation with physicians. "Not infrequently," he said, "with a patient who has a pulse deficit and crepitation at the base of the lungs, when I have planned to operate on a certain day, Professor Fraser comes round and remorselessly says, 'No; two days longer with such-and-such treatment.' It matters nothing that the woman is disappointed, or that my plans are disarranged, or that a husband has come a few hundred miles at great inconvenience; but the patient lives, and we all forget the inconveniences."

Though sure of his ground in justifying what he practised, Dunhill was not given to making exaggerated claims. He did not believe that anyone who had a severe degree of thyroid disease ever again became as normal as if she had never suffered from it. He admitted that sometimes he was guilty of serious errors of judgment. In his early days at St. Bartholomew's, it was the custom for the ward sister also to take charge of instruments in the operating theatre. One of these sisters listened carefully to his ward teaching and missed nothing. A patient in her ward had been pronounced to have only a narrow margin of safety and that it was there-

fore imperative to operate in stages. At operation the first lobe of the thyroid was dealt with smoothly, so smoothly and with so little disturbance to the patient that Dunhill was tempted to continue. Not long afterwards the patient suddenly died. The sister, a small woman, though with great dignity, then faced him with blazing eyes. "If you had stopped," she declared, "when you said you ought to stop, your patient would be alive. You have killed her and you deserve it." Dunhill sadly acknowledged the defects of the human element which was in him, and humbly set himself to learn the lesson he had been given.



Fig. 3. Sir Thomas Dunhill with his theatre sister.

By 1934 Dunhill was able to look back on a long series of patients treated surgically with almost uniform success and with a consistently low rate of mortality. Nevertheless he pointed out with astonishment that according to the Registrar General the annual deaths from Graves's disease in England and Wales had more than doubled in the decade 1922 to 1932. He believed that severe complications had increased in spite of better management and surgery. In 15 years, he had himself seen 203 patients with auricular fibrillation, 47 with glycosuria, 35 with serious mental changes, and many with extreme emaciation. He was plainly dissatisfied with current medical management, and though he was trying hard not to state too plainly that surgical treatment is really the best for almost all patients, that is certainly what was in his mind. At that time, we were privately agreed that no other treatment available ever gave the patients the same degree of lasting improvement in so short a time. The same view persisted well into the era of the antithyroid drugs, and I should not be surprised if it were still a tenable belief. Dunhill was never

tired of pointing out the social and economic importance of obtaining quick and certain results in the less fortunate classes of the community. He always avoided talking glibly about "cure", though he stated as lately as in 1950 his conviction that for patients suffering from secondary thyrotoxicosis accompanied by congestive heart failure surgery is infinitely less lethal than medicine—though never neglecting to obtain from medicine all the help that it can give.

Dunhill was naturally much interested in thyroid pathology and particularly in the various aspects of thyroid malignancy, but no form of thyroid malignancy is common and he did not have the opportunity of making any observations on the subject of special originality. He favoured the simple classification suggested by Allen Graham in three groups: scirrhou carcinoma, or carcinoma simplex, papilliferous adenocarcinoma, and malignant adenoma. He looked upon the so-called "lateral aberrant thyroid tumours" as potentially malignant. He concluded a report on thyroid carcinoma given to the International Conference on Goitre in Berne in 1933 with the words: "My hope is that younger men, equipped with knowledge and endowed with vision, will fill in the gaps in our knowledge, and bring nearer the day when this pathological condition, which is full of interest to investigators but a dread menace to humanity, will be controlled."

Dunhill had come to London in 1920 as a result of his friendship with George Gask during the first World War in France. Gask was about to establish the professorial surgical unit at St. Bartholomew's and took the bold step of introducing an outsider from Australia to that exclusive and conservative institution. The experiment was bold but successful. Dunhill admitted in later years that he felt at first diffident and ill-at-ease, but his new friends soon came to appreciate the quality of the stranger from the Antipodes. He was a perfect colleague—modest, courteous, professionally correct, and of complete intellectual integrity. He would always apply his acute mind with honesty and tenacity to every problem presented to it. Each detail of his surgical technique was thought out and practised until it seemed to be exactly right. His industry was tremendous and he soon acquired a very large private practice while still giving of his best in time and ability to his hospital. Any defects that he had were those of temperament. He was nervous and excitable and was apt to be irritable and too exacting towards his assistants. Everyone knew, however, how hard he drove himself, and in spite of occasional hard words he commanded the utmost loyalty and affection. His lean and wiry figure with his pale keen face and bright eyes gave the impression of a man who allowed himself little mental or physical relaxation. For many years he was plagued by insomnia; he kept an easel set up in his living room where he could do elaborate embroideries when sleep eluded him.

His surgical fame grew so great that embarrassingly large numbers of visitors were attracted to his operating theatre, their presence adding to the tension which was always there. Soon after coming to London he confessed in a discussion at the Royal Society of Medicine that an abdominal operation was thoroughly enjoyable, but that he had never done an operation for Graves's disease without fear and great anxiety, even in cases which seemed simple. I doubt if he ever quite overcame this feeling. Every thyroid operation was still an adventure, although their numbers had risen to many thousands.

The practice of surgery was Dunhill's life, and he greatly preferred it to the task of teaching. It was strange that with his other qualities he did not possess the art of lucid exposition. Although he enjoyed the company of students he knew that he was not very good at teaching them, and, equally, writing did not come easily to him. He never shirked the task of writing what he deemed it his duty to impart for the good of others, but each communication had to be hammered out with great toil and trouble. When speaking, there was not time laboriously to seek the right words, and a characteristic sentence attributed to him when under stress ran: "Tell Miss Thing to put the thing in the thing." Nevertheless his written contributions were effective, being terse and direct. The main object of my remarks has been to put before you the position occupied by Sir Thomas Dunhill in the history of thyroid surgery, but I do not at all want to leave you with the impression that he was a man with a single-track mind working in the narrow furrow of a "thyroid specialist". Far from it! He had practised when a young man as a general surgeon, and so he remained to the end of his career. He was proficient in all branches of major surgery. Circumstances compelled him to write more on the subject of thyroid surgery than on any other, but he made important contributions also to the study of gastric and duodenal disease, of gall bladder disease, of diaphragmatic hernia, of pharyngeal diverticula, and of the surgical removal of intrathoracic tumours. At St. Bartholomew's he took his full share of the day-to-day surgical routine and teaching.

Lord Moran has insisted that Dunhill was not only an exquisite human carpenter, but also had a quite outstanding gift for observation. He was a naturalist practising the art of surgery, which is another way of saying that he was a natural physician who would only use his instruments when he knew he must. In this way he gained the confidence of his medical colleagues and his patients alike. Through association with Lord Dawson of Penn he attended a Royal patient and so came to be appointed Surgeon to the Royal Household, Sergeant Surgeon to King George VI, and extra surgeon to the present Queen. Though he was the least pushful and self-seeking of men, he came to be greatly trusted in the highest quarters. He was a perfectionist in ordinary life as in surgery. He

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applied his mind with the same zeal to his pastimes, whether they were fishing, gardening, or the furnishing of his house with choice pieces of antique craftsmanship. He lived his life with intensity, and I do not think I have exaggerated in my estimate of the degree to which he influenced surgery in England in the years 1920 to 1940. He was the true pioneer in the surgery of toxic goitre and his place in the Temple of History cannot be denied.

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GRANT OF DIPLOMAS TO FELLOWS IN DENTAL SURGERY

AT THE FINAL EXAMINATION for the Fellowship in Dental Surgery held in July, 13 candidates out of 47 were successful.

At the meeting of Council on 3rd August, Diplomas of Fellowship in Dental Surgery were granted to the following:

- MARKWELL, Bryan Drury (*Royal Dental Hospital*).
ALEXANDER, Albert Geoffrey (*University College*).
BRENCHLEY, Malcolm Leslie (*Guy's*).
MOOS, Khursheed Francis (*Guy's*).
LEON, Adrienne Ruth (*University College*).
MILES, Lionel Palmer (*Witwatersrand*).
HENNING, Frederick Rudolph (*Adelaide*).
MENASHE, Benjamin (*Edinburgh*).
DAVIDSON, Ian Farquhar (*Glasgow*).
STRAHAN, Joseph Dermot (*Belfast*).
SOCKETT, Michael (*Durham*).

APPOINTMENT OF FELLOWS AND MEMBERS TO CONSULTANT POSTS

- | | |
|-------------------------------|--|
| C. Q. HENRIQUES, F.R.C.S. | Consultant Surgeon, Ipswich Group of Hospitals. |
| G. M. SANDES, F.R.C.S. | Consultant Venereologist, Mothers' Hospital, Clapton. |
| A. M. B. TOMPKIN, F.R.C.S. | Consultant General Surgeon, Medway and Gravesend Group of Hospitals. |
| P. C. VANNIASINGHAM, F.R.C.S. | Consultant Surgeon, General Hospital, Penang, Malaya. |
| J. C. N. WAKELEY, F.R.C.S. | Consultant Surgeon, Chester Group of Hospitals. |
| F. C. WALKER, F.R.C.S. | Reader in Surgery, University of Durham. |
| H. WICKHAM, F.R.C.S. | Consultant E.N.T. Surgeon, Preston and Chorley Group of Hospitals. |
| J. H. B. YULE, F.R.C.S. | Consultant Surgeon, Blackpool and Fylde Group of Hospitals. |

MALIGNANT MELANOMA OF THE CHOROID TREATED WITH RADIOACTIVE APPLICATORS

Hunterian Lecture delivered at the Royal College of Surgeons of England
on

29th November 1960

by

H. B. Stallard, M.B.E., T.D., M.D., LL.D., F.R.C.S.

Consultant Surgeon, Moorfields Eye Hospital; Consultant Eye Surgeon, St. Bartholomew's
Hospital

ONE OF THE saddest and grimmest decisions we have to make concerns the treatment of a malignant melanoma in an only eye, or when the other eye is too diseased and disordered to be of any visual use. Does excision of an eye containing a malignant melanoma save life or prolong it?

In the case of malignant melanoma of the choroid we cannot apply such a clinical measure as the five-year cure rate of carcinoma in general surgery, for some of our patients may die of malignant melanoma metastases 20 years after excision of an eye. Indeed Chisholm (1953) has reported a case of death from metastases 36 years after excision. The malignant cells may rest dormant until some endocrine or biochemical change in the ageing tissues has allowed their activity. Green and Whiteley (1952) have shown in experimental animals that this tissue immunity to malignant cells may be broken down by cortisone. Some statistics from the U.S.A., about 1939-40, showed that patients who had declined excision of an eye affected with malignant melanoma lived longer than those who had undergone this radical measure, but the run of some statistics may deviate from what is in general the truth.

Westerveld-Brandon and Zeeman, believing that excision of the eye in a patient over 60 years of age does not affect the ultimate prognosis either in saving life or prolonging it, delay this radical surgery until either useful vision is lost or the pain of complicated glaucoma occurs. Watzold in 1930 stated that he agreed with von Hippel that metastases after excision in the stage of complicated glaucoma are not more frequent than when this is done at an earlier stage. MacRae's statistics in 1953 support this, but show that there is a greater death rate in those patients who had raised intra-ocular pressure, and the survival rate is about one year less than those without raised intra-ocular pressure.

THE LITERATURE

The literature concerning radiotherapy for malignant melanoma of the choroid is sparse.

In 1929 Foster Moore treated a Jewish male with a malignant melanoma of the choroid in his only eye by the interstitial insertion of a radon seed on two occasions. The neoplasm shrank to a quarter its original size and remained so until the patient's death three years later from intercurrent disease. A post-mortem was refused.

MALIGNANT MELANOMA OF THE CHOROID

In 1932 I reported two other patients with radon seeds sutured to the sclera over the base of the neoplasm. Failure to achieve adequate regression of the neoplasm in both cases necessitated excision of the eye. Serial sections showed that in one case where the neoplasm measured $9.9 \times 7 \times 4$ mm. the area destroyed by irradiation was $8.5 \times 6 \times 2$ mm., in the other case there was no histological evidence of effective irradiation.

H. Barkan commented in 1934 that the literature contained no case of malignant melanoma cured by radium. Transient regression of the neoplasm had been noted by Parker, Stokes, Janeway and Birch-Hirschfeld. Microscopic examination of excised eyes showed part of the neoplasm destroyed by irradiation, but there remained small areas of well-stained and active tumour cells. In 1949 Joyce reported a patient who had 6/5 vision four years after treatment with radon seeds. In the same year I wrote about a patient with bilateral malignant melanoma of the choroid who had lived 10 years after the application of radon seeds. This patient eventually died of carcinoma of a kidney 17½ years after irradiation for malignant melanoma of the choroid.

DIAGNOSIS

The diagnosis is generally obvious on ophthalmoscopic examination, a greyish brown mass behind the retina, which membrane lies closely apposed to its summit in the early stages. Dilated episcleral vessels without signs of ocular inflammation are often evident over the site of a malignant melanoma situated in front of the equator. A pencil of light applied to the sclera over the base of the neoplasm shows a dull glow in the pupil. Some confirmation, not always infallible, is obtained by intravenous injection of P.32 and Geiger counter estimation. A positive result is suggested by a count of at least 40 per cent. difference between the counter placed on the suspected area compared with a corresponding site in the opposite eye, if this is present, or an opposite quadrant in the same eye. In some cases of doubt—a benign melanoma; a serous choroidal detachment, sometimes annular, mistaken for a "ring" sarcoma of the choroid; a haemorrhage in the supra-choroidal lymph space; a pigmented cyst—it is proper to make a puncture in the sclera over the suspected site and aspirate any fluid that may exist. The sclera is exposed over the base of the suspected lesion, an application of surface diathermy 70 ma. for 5 seconds is made at the site for puncture. Traction sutures in the adjacent extra-ocular muscles and the insertion of a scleral hook into the diathermized site serve to fix the eye. A scratch incision about 1.0 mm. long is made *obliquely* through the sclera to reach the supra-choroidal lymph space. The obliquity of this incision should serve as a valve. Amsler's anterior chamber puncture needle is inserted through the scleral incision and any fluid is aspirated. The resistance of a solid mass is felt as the needle enters the eye. After withdrawing the needle the puncture is again touched with diathermy. Dunphy has never seen any extra-ocular extension of a

malignant intra-ocular neoplasm through multiple therapeutic diathermy scleral punctures made over its base. After aspiration of any fluid, ophthalmoscopic examination is made. The fluid is centrifugalized, but a microscopic examination of the cells is seldom of diagnostic help. Alternatively diagnostic puncture of the neoplasm may be made through the pars plana on the opposite side.

RADIOTHERAPEUTIC APPLICATORS

It is unfortunate that some authorities have stated that malignant melanomata are radio-resistant and that this comparative term should have acquired a meaning synonymous with that of unsuitability for irradiation. This attitude seems to be so widely adopted that it is appropriate to present evidence that some malignant melanomata are radio-sensitive.

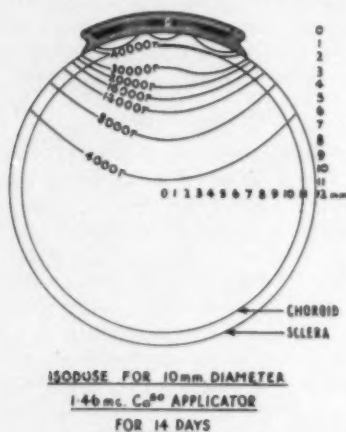


Fig. 1. Diagram of 10 mm. active diameter radioactive Co^{60} applicator to show isodose curves.

It is, I think, desirable to bring the source of irradiation as close as possible to the neoplasm, and this is done by applicators which conform to the scleral curvature. The casing of the applicator is 0.5 mm. platinum and within the 0.3 mm. deep cavity is placed the radioactive cobalt 60, so arranged as to give even isodose curves (Fig. 1). The 5 and 7.5 mm. active diameter applicators have a ring and the 10 and 15 mm. active diameter applicators have rings and a central disc. The radioactive element must overlap the circumference of the neoplasm by at least 1 mm. This overlap is difficult to obtain absolutely when the neoplasm is adjacent to the optic disc and overhangs it. For such crescentic applicators (Fig. 2) are used to embrace the optic nerve head.

MALIGNANT MELANOMA OF THE CHOROID

The diameter of the base of the neoplasm may be measured with fair accuracy by an ophthalmoscopic graticule. The height of the lenticular-shaped neoplasms before bursting through Bruch's membrane seems to average one-third to one-half of the diameter of the base.

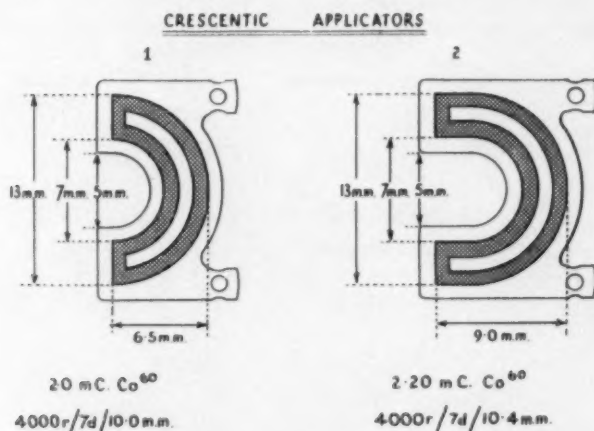


Fig. 2. Crescentic radioactive applicators to embrace the optic nerve.

DOSE

The r dose is still empirical and under trial. It is at present impossible to assess precisely the r dose received throughout the intra-ocular neoplasm for by no means are all of these symmetrical in shape. Calculations from isodose curves suggest that in the majority of the 59 patients in this series the summit of the neoplasm probably received about 7,000–14,000 r and the base about 20,000–40,000 r in seven to 14 days respectively (Table I).

TABLE I
APPROXIMATE R DOSE AT BASE AND SUMMIT OF NEOPLASM

Base	Summit	Successes	Failures	Uncertain to date
20,000	7,000	31	11	11
30,000	10,000	4	1	1
40,000	14,000	6	1	—
60,000	21,000	14	4	7
70,000	24,000	2	—	—
72,000	25,000	—	3	—
80,000	28,000	—	—	1
120,000	42,000	5	1	1
		—	1	1

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In Table I those who received 60,000 r at the summit and 120,000 r at the base had two or three radio-active applications. The greater number of successes occurred in those who received 7,000-14,000 r at the summit and 20,000-40,000 r at the base of the neoplasm. Success followed a single application to 21 patients and a second application to 9 (Table II).

TABLE II
NUMBER OF APPLICATIONS

No. of applications				Successes	Failures	Uncertain to date
1	..	..	..	31	11	11
2	..	..	..	21	7	8
3	..	..	..	9	4	2
3	..	..	..	1	—	1

TECHNIQUE OF APPLICATION

The site and size of the neoplasm are confirmed at operation by the application of either diathermy or katholysis at three or four places on its periphery. Within this marked area the radioactive applicator is placed,

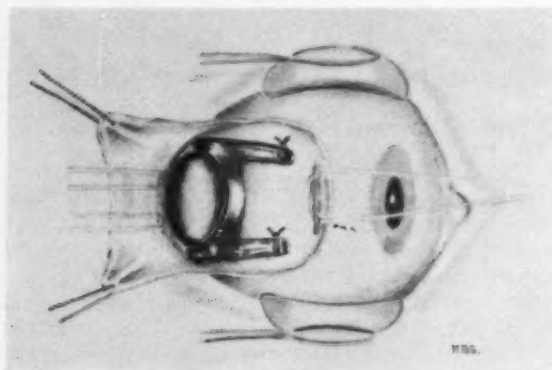


Fig. 3. Radioactive applicator sutured to sclera precisely over the base of the neoplasm.

the sites of the holes in the lugs are marked on the sclera with gentian violet and here sutures are passed to fix the applicator (Fig. 3). Any reflected extra-ocular muscle is sutured in position and the incision in Tenon's capsule and conjunctiva closed.

CLINICAL FACTS

This series of 59 patients is, of course, too small for the figures to be of definite significance. Twelve patients had their only eye affected by a malignant melanoma; in 19 the other eye was almost blind, either from

MALIGNANT MELANOMA OF THE CHOROID

some gross pathological disturbance or amblyopia; 14 patients declined excision; and in 14 it was considered justifiable to try irradiation because vision was still good, the neoplasm had not burst through Bruch's membrane and was between 4-9 mm. in diameter. It is remarkable that among these 59 patients there was one with bilateral symmetrical malignant melanoma of the choroid at the age of 36; and two others who had malignant melanoma of the iris and ciliary body in one eye and malignant melanoma of the choroid in the other (Fig. 4).

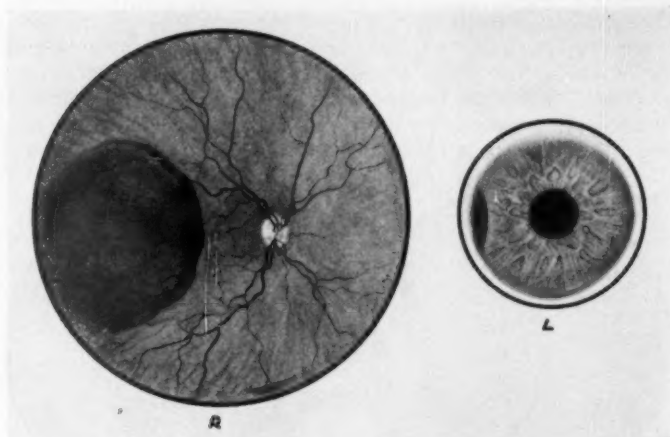


Fig. 4. Malignant melanoma choroid right eye. Malignant melanoma ciliary body and iris left eye.

Sex

There is a predominance of males in the proportion of 33 to 26 (Table III). Among the 31 patients in whom irradiation has been apparently successful to date, 19 are women and 11 men. Of the failures requiring excision of the eye, eight were men and three women; of the three patients who have died of malignant melanoma metastases, two were men and the other a woman.

MacRae has stated that females tend to develop malignant melanoma earlier in life than males, but the death rate from metastases is 31.4 per cent. in females compared with 57.6 per cent. in males. Does some endocrine factor in the female check or delay the appearance of metastases, and does such a factor affect the radiosensitivity of the malignant melanoma cells?

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TABLE III
SEX INCIDENCE IN SUCCESS AND FAILURE

		Men	Women
		33	26
Success	12	19
Failure	.. ..	8	3
Blind eye	.. ..	1	—
Died. Metastases	.. ..	2	1
Died. Intercurrent disease	.. ..	2	—
Uncertain results to date		8	3

Age

The age of onset is seldom determined with accuracy. Some relatively slow growing neoplasms may have been present unheeded by the patient a year or more before advice is sought. The age pattern (Table IV) in this series follows that of any large series of patients suffering from malignant melanoma, the larger number of patients are in the fifth and sixth decade of life, the youngest was 13 and the oldest 76; both of these were males.

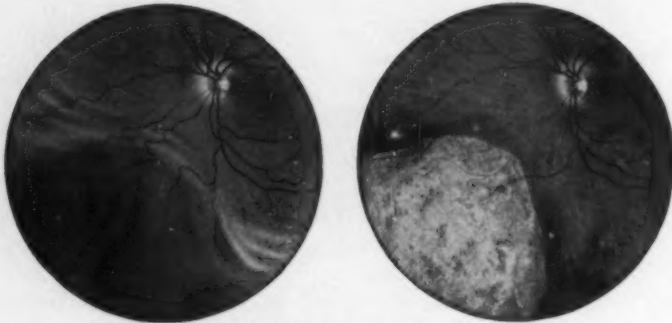


Fig. 5. Malignant melanoma choroid. Before and after irradiation.

TABLE IV
AGE INCIDENCE

13 years	.. ..	1
14 years	.. ..	1
32-40 years	.. ..	9
41-50 years	.. ..	8
51-60 years	.. ..	9
61-70 years	.. ..	9
71-76 years	.. ..	2

Does age have any effect on response to irradiation? In this series the neoplasm 10×10 mm. in a boy of 13 (Fig. 5) and 8×8 mm. in a girl of 14 was more rapidly reduced by irradiation to a flat plaque than was the case in patients in the fifth and sixth decade of life. Also it seemed that irradiation was particularly effective in four patients between 32 and 39 years of age.

MALIGNANT MELANOMA OF THE CHOROID

Site and size of the neoplasm

The larger diameter of the neoplasm, measured with an ophthalmoscope graticule before operation and checked by katholysis markings at operation, varied between 3 and 16 mm. in the 31 patients in whom irradiation has seemed successful to date, the diameter of the majority being 7-8 mm. It is remarkable that three patients in whom the neoplasm was 16, 14 and 13.5 mm. respectively have done well to date. The neoplasm in the 11 patients who failed to respond to irradiation measured between 4.5 and 10 mm. in diameter. Of the 11 patients in whom the effect of irradiation is still uncertain, five had a diameter of the neoplasm between 6 and 12 mm. and six between 13 and 15 mm.

The site of the neoplasm seemed to be of little consequence in achieving either success or failure by irradiation.

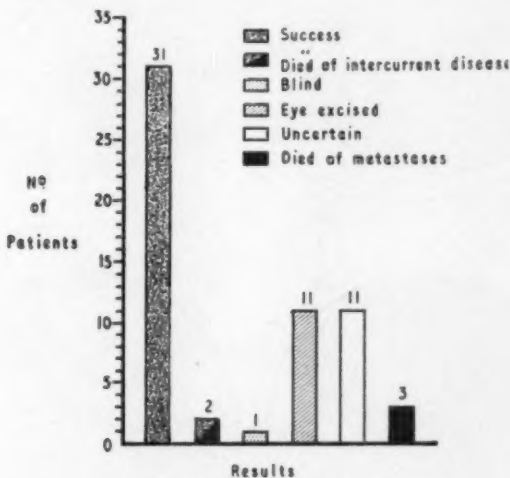


Fig. 6. Table of results.

RESULTS

Successes

To date 59 patients have been treated by the technique described (Fig. 6).

Thirty one of these are successful to date, for at the site of the irradiated neoplasm there is a flat scar with pigment debris (Fig. 7 (a) and (b)) the adjacent fundus is stippled with white and brown dots and the retinal vessels in the vicinity are attenuated and, in one instance, a patient with vascular hypertension, the arterioles in the irradiated quadrant have become occluded. In two patients with large neoplasms, the one 13.5 and the other 14 mm. in diameter, a cyst containing debris and much smaller

than the size of the neoplasm remained at the site of irradiation (Fig. 8 (a) and (b)) and in one of these the cyst collapsed. In four patients the irradiated neoplasm shrank considerably, but there has remained some elevation at the centre of the main mass of the neoplasm which to date

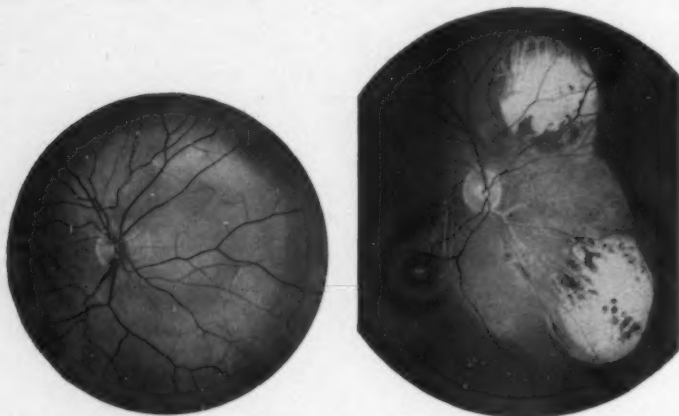


Fig. 7. Malignant melanoma of choroid adjacent to optic disc: (a) before irradiation; (b) after irradiation.

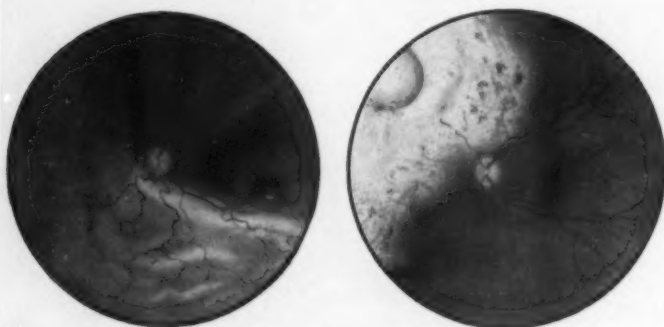


Fig. 8. Malignant melanoma choroid 14 mm. diameter: (a) before irradiation. (b) after irradiation.

has shown no sign of increasing in size. One patient five years after successful irradiation of her eye has developed carcinoma of her left breast. Another patient who survived 17½ years after irradiation of a bilateral malignant melanoma died of carcinoma of the kidney. It is an interesting fact that a patient apparently cured of one kind of malignant disease may be susceptible to and die of another. In my retinoblastoma series, two

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patients in whom the retinoblastoma was destroyed had, in the fourth decade of life, carcinoma of the kidney in one case and carcinoma of the lung in the other.

Failures

Among the failures the irradiated eye has been excised in 11 patients because it was doubtful whether the neoplasm was destroyed, the vision had become less than 6/60 and the retina detached. In three of the patients a wait of two months after irradiation was probably inadequate in which to judge of effective recession of the neoplasm, and in the light of later experience it would seem proper to wait four to six months, provided, of course, that the neoplasm was not growing during this period of post-irradiation observation. Three patients have died of metastases. In one it was evident that this was likely, for surgical exposure of the sclera over the base of the neoplasm showed that it had already extended through the sclera. She had vascular hypertension and had already suffered cerebral vascular episodes. She lived with useful vision for two years after irradiation. Another patient had a large neoplasm which occupied most of the lower half of the sclera. He lived two years after irradiation and had 6/36 vision. In the third the neoplasm was on the nasal side and measured 14 mm. in diameter. After irradiation it shrank to a flat scarred area with cystic debris and seemed to be destroyed. He had 6/18 vision until his death one-and-a-half years after irradiation.

Uncertain

The fate of the affected eye in 11 patients is still uncertain. The neoplasm has receded after irradiation to an appreciable extent, but there remains a raised mass in the centre and it is doubtful whether this contains malignant melanoma cells in a damaged state incapable of division to date but possibly a potential danger. This state of affairs has been present for five years in one of these patients and for two-and-a-half years in another. Of the other nine patients, two have been treated within the last 18 months and six within the last six months. In the two patients, one of five years and the other 18 months after irradiation who had a neoplasm about 15 mm. and 14 mm. in diameter respectively which had burst through Bruch's membrane, the Geiger counter test was negative. Had the neoplasm been active, one would have expected an increased count.

Survival to date

Figure 9 shows the survival in years, to date, of the 31 patients in whom irradiation has seemed to be successful. It is, of course, obvious that insufficient time has elapsed to present to you a true picture of the results of irradiation of malignant melanomata. During a span of 20-25 years it is likely that some, perhaps many, of those presented as successful results

to date will have failed either through local recurrence or metastases. With present methods of examination it will be impossible to assess whether the metastases originated before the treatment and lay dormant or occurred after it.

PATHOLOGY

From examination of serial sections of the malignant melanomata which failed to respond to irradiation I had hoped to learn something about a pattern of histological facts common to all. Perhaps 10 (one of the 11 excised eyes is missing) is too small a number of eyes to be of value for such

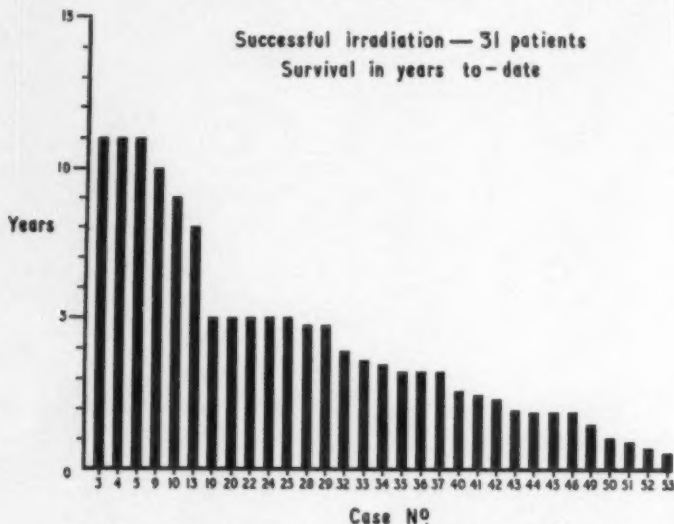


Fig. 9. Survival in years of 31 patients successfully treated to date.

a study. The sizes of the neoplasms were between 5 and 10 mm. in their greater diameter, the majority being about 8 mm., and the average height was one-third to one-half that of the diameter. Two of the neoplasms had burst through Bruch's membrane. Irradiation had reduced the size of most by 2 to 5 mm. It is, of course, possible that the dehydration and fixing fluids may account for part of these diminished measurements. One tumour after two radioactive applications, which was reduced from 7×5.5 to 5.5×4.5 mm., contained an area of radio-necrosis 5×3 mm., so that only a narrow zone of viable malignant cells remained. It might be expected that the more malignant epithelioid and mixed-celled types would be more radio-sensitive than the spindle-celled and fascicular varieties of malignant melanoma, but this has not been the case in this small series.

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Three specimens showed epithelioid cells; two mixed epithelioid and spindle cells; two mixed and two spindle. In one specimen there were swollen neoplastic cells faintly staining, damaged by irradiation but not destroyed.

The reticulin content, generally a good prognostic feature, was heavy in five and light in two. This heavy reticulin content in 50 per cent. of these specimens may be significant or mere coincidence in this small series. Does reticulin in some way protect the cells of the neoplasm from irradiation?

There was heavy pigmentation, usually a bad prognostic feature, in seven of the specimens, moderate in one, light in one and minimal in one. One specimen showed trabeculae of degenerated cells extending from the base to the summit of the neoplasm. Large colloid bodies on Bruch's membrane were evident in two cases and large blood spaces in one. The choroid adjacent to the neoplasm is fibrosed and relatively avascular, and exudates are evident at the periphery of the neoplasm. The retina overlying the neoplasm is oedematous, cystic, and disorganized.

COMPLICATIONS

Peri-macular exudates have appeared in 10 patients, in nine of whom the irradiated growth has been successfully destroyed and is flat; in the other the result is still uncertain four years after irradiation. The exudates appeared five months after irradiation in one case and cleared in three months, and from one year and seven months to seven-and-a-half years in the others. In four patients, all females, the exudates resembled circinate retinopathy. Minute petechial retinal haemorrhages were present in most of these cases.

Retinal haemorrhages were evident in two patients, one two years and nine months and the other three years after irradiation.

Vitreous haemorrhage occurred in one patient. A posterior cortical lens opacity 1 mm. in diameter appeared 7½ years after irradiation in one patient. Partial scleral sloughing occurred in two male patients, both with large neoplasms which required the application of a 15 mm. active diameter radioactive disc. In one of these the defect was shelving and 3 × 4 mm. on the surface of the sclera and less in its deepest part. Its edges were freshened with a 6 mm. trephine and the defect filled with a corneal graft.

VISUAL RESULTS

Among the 31 patients treated successfully to date vision has remained good in 15 (6/5 in 5; 6/6 in 4; 6/9 in 5; in another patient senile cataract has recently reduced vision from 6/6 to 6/36).

In four patients the irradiated neoplasm was at the macula and in four others it was adjacent to it so that this accounts for a reduction of vision to between 6/24 and 1/60. In seven patients peri-macular exudates and small petechial haemorrhages lowered sight between 6/18 and 6/60. In one patient senile cataract caused deterioration of vision from 6/6 to less than 6/60.

CONCLUSION

To sum up, it seems evident that some malignant melanomata of the choroid are destroyed by the application of a radioactive source to the sclera precisely over the base of the neoplasm. That better results may be expected when the neoplasm is 8 mm. or less in diameter, has not burst through Bruch's membrane and is not adjacent to the optic disc. However, there have been successes when the neoplasm has been 13-16 mm. in diameter. The prognosis seems to be better in the young and in women. Most of the successes followed a single application of radioactive cobalt 60 and a dose of about 14,000 r at the summit of the growth and 40,000 r at its base.

I thank especially my old chief, Foster Moore, for the privilege of working with him, now over 30 years ago, in the pioneer days of radiotherapy for intra-ocular neoplasms. I thank Mr. G. Innes for much help and advice in the construction of the radioactive applicators; also all those who have sent me patients. I am grateful to Dr. Peter Hansell, Medical Illustration Department of the Institute of Ophthalmology, for much help with the illustrations.

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GIFT OF MINIATURES

SIR CECIL WAKELEY has presented to the College his collection of miniatures of medical men, portraits by P. Buckman, Director of the School of Art at New Cross, of Harvey, Pott, Jenner, Darwin, Huxley, Bland-Sutton, Arthur Edmunds, Thomson-Walker, St. Clair Thomson, G. F. Still, Buckston Browne, Lord Moynihan, and Sir Arthur Keith.

THE CARE OF THE INJURED

Ruscoe Clarke Memorial Lecture delivered at the Royal College of Surgeons of England

on

25th April 1961

by

Sir Harry Platt, Bt., LL.D., M.D., M.S., F.R.C.S.

President, International Federation of Surgical Colleges. Consultant Adviser in
Orthopaedic Surgery, Ministry of Health; Emeritus Professor of
Orthopaedic Surgery, University of Manchester.

INTRODUCTION

THE LECTURE WHICH it is my privilege to give to-day commemorates the life and work of one who in a comparatively short span of years—for he served the Birmingham Accident Hospital for little more than a decade—made outstanding contributions to the surgical care of the injured. Ruscoe Clarke came to Birmingham already armed with a wide and varied surgical training and experience. Before the Second World War he had visited the United States, where in the teaching hospitals of Boston he had enjoyed the stimulating atmosphere of that great centre of the art and science of surgery, an experience which had whetted his appetite for research. On his return to the United Kingdom he found similar encouragement and ample opportunities for research within the Professorial Surgical Unit at the Postgraduate Hospital in London. Very soon he was heavily engaged in the emergency surgery of the Blitz, but found time for a special study of traumatic shock. Then came a period of service in the Royal Army Medical Corps, mostly in forward operating units in the North African and Italian campaigns. If it be true that, on arrival in Birmingham, Ruscoe Clarke was exceptionally qualified to undertake what came to be his mission in life, it is also true that no other hospital in Great Britain could at that time have given him the facilities and background which he needed. The Birmingham experiment—launched in an atmosphere of doubt and criticism—of the taking over of a large general hospital to be devoted exclusively to the reception and treatment of accidents, had more than justified the belief of its founders. It is interesting and fascinating to see in the kaleidoscopic pattern of historical events, whether in the larger world of affairs or in the smaller world of medicine, the influence of epoch—the co-existence of a man unusually well equipped for a special task, and the right environment for the flowering of his talents. It was so in the 1890s, when the Manchester Ship Canal was constructed, and the young Robert Jones (1858–1933) was then in Liverpool, ready to organize and direct the first accident service of its kind in Great Britain.

During the last few years of an all too short life, in addition to his share of routine clinical work, Ruscoe Clarke had directed his enquiring mind to an investigation into the disturbances of the circulatory mechanisms of the body which complicate some of the most severe type of injuries. In effect this was a study of the criteria of survival. He was clearly a man who in the words of Altmuth Wright had a "pain in the mind", and

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he conveyed his own zest for knowledge to the young men in his research team. Whatever may be the structural and geographic future of the Birmingham Accident Hospital, the tradition of fundamental research established by the work of Ruscoe Clarke must surely be perpetuated. It is also fitting on this occasion that we pay due tribute to the part played by another man—the Surgical Director of the hospital from the day of its inception—my friend and colleague William Gissane, whose inspiration and leadership has made the hospital something more than a surgical factory.

THE EVOLUTION OF ACCIDENT SERVICES

The care of the injured is perhaps the oldest branch of the surgical art, and in this connection we have evidence that the ancient civilizations were served by practitioners of considerable skill. Doubtless the mortality was high in severe wounds of the extremities, in visceral injuries, and in head injuries. These deaths would generally occur on the battlefield, or on occasion be the result of encounter with wild animals during hunting. But in the less severe injuries of peace time, survival was expected, and it is from the recorded story of the treatment of fractures and dislocations throughout the ages that we glean our indebtedness to the past. The story is too long to recount here, but I have selected a few phases of historical interest, and I begin by taking you back over two thousand years ago. In the skeletal remains of mummies from the Nile Valley belonging to the 5th Dynasty (2780–2625 B.C.), fractures, some of them battle injuries, have been found to be healed in good position. Furthermore, these broken bones had obviously been efficiently immobilized by splints of pasteboard, gum arabic, and moulded wood. It will be noted that these splints fitted the contour of the limb, unlike the flat wooden splints in use in the early 20th century when I was a medical student.

The first comprehensive treatise on fractures and dislocations, one of the texts of Hippocrates, the Father of Western Medicine, emphasized the importance of the early reduction of deformity and the value of traction in maintaining alignment. Moreover, in the medical centres of the temples on the islands of Cos and Epidauros, Hippocrates and his school established the earliest known health centre, where a planned convalescence with a range of treatments including exposure to sun and air, hydrotherapy and exercise, was available for the deformed and disabled. And yet it has been said in this, the second half of the twentieth century, that rehabilitation is a child of the Second World War! It is chastening to learn that the methods of Hippocrates continued to be basic techniques in the treatment of skeletal injuries until the middle of the 19th century. In the Middle Ages our knowledge of contemporary fracture treatment is contained in the writings of the military surgeons, and notably those of the great master Ambroise Paré (1510–1590). Incidentally it is clear that in the treatment of compound injuries, Paré counted on a substantial survival rate. In the

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latter part of the 18th century, John Aitkin of Edinburgh (*circa* 1780) devised a number of metal extension splints for fractures of the lower limb, and he also used a walking splint not unlike the classical caliper of H. O. Thomas (1834–1891). Aitkin taught the importance of bringing the splints to the scene of the accident—in those days often the battlefield. In this practice he anticipated what happened in the First World War in France, when the Thomas's splint was first supplied to the forward dressing stations with a resulting spectacular decline in the mortality in compound fractures of the femur, from 80 per cent. to 20 per cent. Plaster of Paris as an alternative to conventional wooden splints, though tried out by a Dutch surgeon in 1814 and used in Germany after 1828, did not become the predominant method of splinting fractures until the opening of the Vienna Accident Hospital under the direction of Lorenz Böhler in 1925.

As we move towards the era of the first organized fracture services in Great Britain and elsewhere, we can look back on a number of outstanding landmarks. In the 19th century, the Listerian revolution—the antiseptic operating theatre and dressing techniques which first robbed compound fractures of some of their most serious consequences; the abandonment of splinting in the treatment of lower leg fractures by Lucas-Championnière (1843–1913); and early weight-bearing in leg fractures guarded by plaster splints introduced by Delbet (1861–1925). In the early part of the 20th century, the first systematic use of open fixation of fractures by Arbuthnot Lane (1865–1943) and Lambotte (1866–1955); and the technique of skeletal traction described by Codivilla (1851–1913) and Steinmann (1872–1936).

But despite the availability of such important reinforcements in the treatment of fractures both simple and compound, in the years immediately preceding the First World War, in Great Britain at least, it was realized that the quality of the average hospital results left much to be desired. This dissatisfaction led to the setting up in 1911 of a Committee of the British Medical Association, who after examining large numbers of clinical records and actual patients—some three thousand in all—recommended the more frequent adoption of open reduction and internal fixation.

These findings were challenged by Robert Jones in a notable paper in 1912, in which he pleaded for a more efficient training of surgeons in conservative methods of fixation, as illustrated by the use of the Liverpool malleable metal splints and the Thomas's splint with fixed traction. At that time in every hospital outside the sphere of influence of the great Liverpool School, fractured limbs were immobilized in flat wooden splints, and fractures of the femoral shaft were controlled by the long Liston with traction by weight and pulley. Thus, in actual fact, the Hippocratic techniques had undergone little change, except of course where the open fixation of fractures was practised quite often with disastrous results. There was as yet no suggestion that special fracture units were desirable.

The story of the evolution of the organized accident services in existence to-day in Great Britain has often been told. It began with the military orthopaedic centres of the First World War, directed by Sir Robert Jones; then came the first few fracture departments in non-teaching and teaching hospitals in the early years after the War, organized on the basic principles of segregation, unity of control, and continuity of treatment. It will be observed that I put non-teaching hospitals first, for they led the way. A description of the fracture service set up at the Ancoats Hospital, Manchester, with the whole-hearted encouragement of my two general surgical colleagues, can be found in the *Lancet* (1921). There were, alas! surgeons on the staffs of some famous teaching hospitals who for a long time were implacably opposed to any sort of segregation. They were blind to the fact that this movement had wider implications; it was the forerunner of a "wind of change" in the realm of surgery. The old concept of the whole range of general surgery embraced in the practice of a single omniscient and omnicompetent man was no longer tenable, and the major divisions and specialisms of surgery were one by one crystallizing out—orthopaedics, neurosurgery, plastic surgery, thoracic surgery, and urology. By the time the Second World War came upon us it was not difficult to adapt the contemporary peace-time pattern of organized fracture services, of orthopaedic centres for long-term reconstructive surgery, and of rehabilitation facilities which had become more widely distributed during the inter-war years, to serve not only the needs of the injured fighting men, but to meet a new emergency situation presented by a civilian population under fire.

And so to the last chapter of this brief recital of the evolution of organized accident services—but in fact the opening chapter of a new story—after the War, the creation of many new orthopaedic-accident units as part of the expansion of the consultant services of the National Health Service. These new centres are for the most part staffed by a younger generation of orthopaedic surgeons well trained and experienced in the handling of major injuries of the locomotor system, and from whom most valuable contributions relating to conservative and operative techniques, and to the study of end results, can be regularly heard at meetings of the British Orthopaedic Association. We have also to note the all-important role which the neurosurgeons and plastic surgeons have come to play in this field of the organized care of the injured.

The effectiveness and deficiencies of existing organized accident services, and in some instances of unorganized services, have been tested in recent years in a number of unexpected emergency situations. I have described elsewhere the lessons to be gained from an account of the handling of the injured in the Harrow and Wealdstone Railway disaster in 1952; the Lewisham train disaster in 1957; and the Manchester bus disaster in 1957. In the latter, hindsight showed that it would have been possible to predict some of the types of injury to be dealt with, if the circumstances of the accident had been known in advance.

THE CARE OF THE INJURED
THE PROBLEM TO-DAY

Increasing numbers

In Great Britain we have come a long way from the days of the unsegregated treatment of major injuries in non-teaching and teaching hospitals, and our organized units in their present form have been models to be copied by other countries. But once again the structure of our accident services—their organization within hospitals large and small, and their strategic deployment within regions—has come under scrutiny. For, as is well known to the medical profession and to the general public, during the past ten years, not only has the number of accidents of all kinds risen rapidly, but the increase in numbers of certain categories of major injuries has posed new problems of administrative and surgical urgency. In the year 1955 nearly 2½ million people sustained injuries: 44 per cent. of these were home injuries; 33 per cent. were injuries at work; and 10 per cent. were road traffic injuries. Since then the numbers have risen steadily each year. It is well understood that a large proportion of the yearly toll of accidents will always be minor injuries, but even minor injuries, unless skilfully and promptly dealt with, involve substantial costs to the nation in terms of loss of working days and in insurance benefits. It is, however, the rising number of accidents of road traffic which has shocked the public conscience in many countries, and in Great Britain has called for a review of our organized preparations to deal with this increasing menace to life and to bodily safety. In 1958 the numbers of injured on the roads had reached the total of 293,797, with 5,970 deaths. In these incidents, 7½ million vehicles were involved, 22 per cent. being motor cycles, scooters, and mopeds. The figures recorded for 1959 (Ministry of Transport and Scottish Home Department) show an over-all 10 per cent. increase in accidents; a 9 per cent. increase in fatal injuries; a 17 per cent. increase in serious injuries; and, as one would expect, a corresponding increase of 12 per cent. in the index of motor traffic. During the ten-year period 1949–59 the increase in the numbers of victims was small amongst pedestrians and cyclists, but striking amongst motor cyclists, including the users of scooters and mopeds. In this category of road users the accidents have doubled during the past five years. In the last five years also there has been a one-third increase in the number of injuries in child pedal cyclists. In 1959 there were 2,807 serious injuries in this group and 149 children lost their lives.

The recollection of the shocking figures for road traffic accidents of the August Bank Holiday week-end and the Christmas Eve of 1959—the latter with the heaviest death roll ever recorded in one day—makes us wonder what horrors the future will reveal. One thing is certain at this stage—that the curve of the numbers of road accidents will continue to climb, as more vehicles, and with them more humans, come on to roads both old and new—unless—unless what?—unless there is a public demand

for courageous drastic legislation. This is not the immediate concern of the medical profession. Our responsibility is to plan wisely, to meet both predictable and unpredictable emergencies. We can take little comfort from the knowledge that other countries such as the United States of America are facing similar situations. The world figures for 1958, based on a total population of 553 million people, show that accidents cause more deaths than any other single illness, except cancer and cardiovascular disease, and that in many countries they kill more children than all other causes combined (W.H.O. World Health Day Message 1961 by the Director-General).

The causes of accidents

The accident problems which confront all highly developed nations are not exclusively concerned with the hazards of modern road traffic. In compiling hospital records it has long been the traditional practice to classify injuries whether treated as out-patients or in-patients into three main groups—*Domestic*; *Industrial*; and *Road Traffic*.

The *Domestic* group embraces accidents of the home and its immediate environment. These are increasing in adult populations in accordance with the relative increase in the proportion of elderly and ageing individuals, often living alone. Such injuries as fractures of the neck of the femur in the aged, if resuscitation measures are not promptly applied, may carry a high mortality, and for those who survive the immediate effects of the accident, operative treatment of the fracture and the subsequent rehabilitation of the patient may involve long periods of hospitalization. In the treatment of the injuries of the aged a close liaison between accident units and geriatric units is essential.

Children also contribute to the increased number of domestic injuries. In the home itself, it is amazing that young children escape injury so often when we consider such ever-present hazards as falls from a high chair and the risks of burns and scalds. The prohibition by recent legislation of the sale of unguarded electric fires has been a notable step in the field of prevention; and the deliberate choice of non-inflammable clothing material for children is another wise precaution in a country where open fires are still traditional.

The preponderance of the *domestic* group of injuries continues to be a striking feature in the records from the majority of the organized accident units in general hospitals in Great Britain. Thus, in a total of 3,715 injuries of the locomotor system treated in 1949 by the Orthopaedic Department of the Manchester Royal Infirmary, 75 per cent. belonged to the domestic group. In this total there were 2,926 fractures and dislocations, and 789 major soft tissue injuries, i.e. tendon, nerve injuries, and severe lacerations. In that year the figures for the *industrial* group were 782, all adults; and for the *road traffic* group, 253: adults 211; children 42. Ten years later, 1959, in the same hospital unit, the proportion of accidents

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of the home dealt with had dropped to 60 per cent. During that interval there had been a steady increase in the numbers of new petrol-driven vehicles on the roads.

In the *Industrial* group of injuries as a whole in Great Britain it would appear that there is unlikely to be any spectacular increase in numbers in the future—indeed in the heavy industries it is our experience that the numbers of severe injuries have declined in recent years. This seems to be true of the incidence of spinal fractures complicated by paraplegia in mine workers. To-day the severe spinal injuries come from the roads. It is said, however, that in 1960 there was a rise in the accident rate in the building industry. A considerable proportion of industrial injuries, more especially those occurring in the lighter industries in premises covered by the Factory Acts, are of a minor nature. Many are effectively treated in works surgeries, thus lessening the numbers of patients referred to hospitals.

The accidents of *farming* in this age of mechanization come into the category of industrial injuries. These injuries tend to be multiple, and lacerations with or without division of tendons and nerves are predominant lesions. In the United States, farming accidents are responsible for more occupational deaths each year than those sustained in any other major industry. In industrial injuries, as indeed in accidents everywhere, human carelessness plays a dominant role. The total elimination of this factor in the causation of accidents may never be achieved, but much can be done by propaganda and education of both young and old in the methods of avoiding risks.

STRATEGIC PRINCIPLES IN THE ORGANIZATION OF ACCIDENT SERVICES

Having had a glimpse of the problems to be faced, we may now turn to a consideration of the broad strategic principles on which accident services should be organized, or where necessary re-deployed. In Great Britain this is the task of Regional Hospital Boards. No detailed national plan can be devised *in vacuo* from a single headquarters. But, on the other hand, at this level the broad strategic outlines can be defined. The pattern of organized accident services, whether applied to part of a region or to a large city, will depend on many different considerations of environment and logistics: climate—e.g. liability to fog; available systems of transport—railways, roads, planes, and helicopters; the site of industries, light or heavy; the special topographical features of some rural communities; and so on.

It will be realized also that the over-all problem is not exclusively one of the deployment of surgical skills. Any organization devised to deal with unexpected major catastrophes, or indeed to deal with the routine handling of accidents in cities and rural areas, involves the coopera-

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tion of civilian services—ambulance services; police; fire brigades; and the voluntary first-aid organizations of the Red Cross and St. John. In a grave situation the medical services of the armed forces should always be available, and I am sure that these reinforcements are constantly in the minds of the Directors-General. Behind such emergency organizations stands the second line of defence when needed; the health, housing, and welfare departments of the Local Authorities. In a major flood disaster all these may have to be invoked. In such incidents the numbers of injured persons may be small, and the problem becomes one of urgent social rather than medical importance.

Let us look at the situation more closely in terms of the needs of the victims of accidents. An injured man has certain fundamental demands—prompt first-aid; a diagnosis; the treatment of shock and blood loss; transport to a centre where skilled definitive treatment can be instituted; and finally in major injuries, rehabilitation, both medical and industrial. The general public, now informed and interested in the problem of survival, looks to the medical profession for planned organizations which will meet such individual needs. These needs must determine the structure of any organized scheme. The pattern can be stated in simple terms—a comprehensive accident scheme covering any given community will be based on a *major central accident unit* at a general hospital or within a general hospital group. Affiliated to the major centre will be a number of peripheral outposts. In some regions a three-tier scheme may be appropriate.

A central major accident unit has to be designed to deal with both routine and unexpected emergency situations. It must provide a resident surgical staff of senior status; a 24 hours' X-ray service; a complete range of resuscitation facilities; and have the capacity to set up extra beds when needed. On these fundamental requirements there is universal agreement. From a knowledge based on the experience of many years, with due allowance for the changing pattern in the incidence of different categories of injury, it is not difficult to see what surgical skills should be deployed at the consultant level. In my judgment, for the efficient treatment of the predominating categories of injuries which will form the clientele of a major accident centre, three types of surgical expertise are needed: (1) the orthopaedic surgeon; (2) the neurosurgeon; and (3) the plastic surgeon. I put the orthopaedic surgeon first because 75 per cent. of the lesions in the intake of injuries will involve the structures of the locomotor system. The next substantial group embraces the head injuries. The role of the plastic surgeon in the acute phase is to cooperate in the treatment of extensive soft tissue injuries, to organize the treatment of burns and to provide the long-term reconstructive surgery needed by such victims. It is known that other categories of injury are likely to be small in numbers. For them, behind the primary team, stand the general surgeons, the thoracic surgeons, and the dental consultants. From the

THE CARE OF THE INJURED

staffs of a major accident centre, both consultant and resident, flying squads can be organized, but the need for major surgical skills at the scene of the disaster is debatable.

In very large cities this pattern of major accident centres implies the division of the city into zones, and thus, as in the regions, the prohibition of the intake of accidents by a multiplicity of hospitals which by long and cherished traditions have maintained an open door.

The need for peripheral out-posts for the reception of minor injuries is particularly a problem in rural areas. When such units are a necessary part of the strategic plan, the general practitioner is now brought into the picture. In such out-posts linked to major centres, certain general practitioners will have to be designated as officers in charge of accidents, and given special instruction in resuscitation techniques and in emergency splinting. Furthermore, peripheral out-posts, once established, must be visited regularly by consultants from the major centre, and from time to time the designated practitioners should be given regular refresher courses.

ACCIDENT SERVICES AND MEDICAL EDUCATION

Any review of the effectiveness of existing accident services, more particularly the plans for the deployment of medical staffs, will lead to a scrutiny of the content of both undergraduate and post-graduate education in relation to the new and urgent problems which the increasing numbers of accidents presents to the nation. It is clear that the undergraduate student should have periods of duty and instruction in departments where accidents are received, and should be given a comprehensive, even if brief, tour of a large organized accident service in action. In the pre-registration year and in the post-registration house officer posts, duties in the accident unit should be part of the responsibility of all residents, house physicians as well as house surgeons, as it was in the last generation. Furthermore, ample experience in the treatment of accidents as part of major emergency surgery should be introduced into the period of higher training of all aspirants to a consultant surgical career, whatever special field they may intend to adopt later. This means that all senior registrars in both the major specialties and general surgery should at this stage of their careers be accomplished accident surgeons. A pool of such skills is essential for unexpected catastrophes at home, and for temporary help in countries in need.

CONCLUSIONS

Although our first duty as surgeons is as of old the healing of wounds, we cannot be blind to the need for concerted efforts in the field of the prevention of accidents. In this vital educational and social problem we have an equally important role to play. Meanwhile, we must see to it that

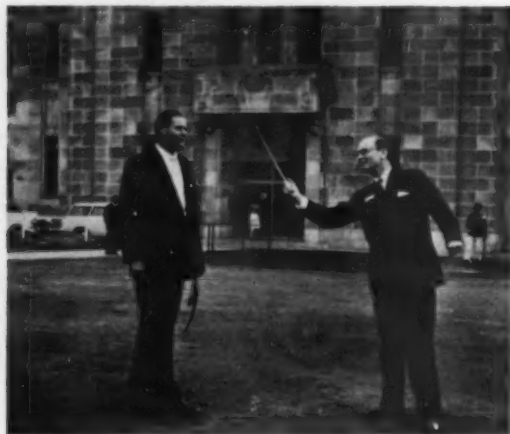
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in the new or reorganized major accident centres which will long be needed, there will be facilities for research which will attract such dedicated men as the subject of this Memorial Lecture, Ruscoe Clarke.

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SIMS COMMONWEALTH TRAVELLING PROFESSOR



THERE ARE OCCASIONAL moments for relaxation during the arduous commitments of the Sims Travelling Professor's tour. The illustration shows Professor Hedley Atkins, who has recently visited Australasia, learning the art of throwing a boomerang in the quadrangle of Brisbane University, under the supervision of Mr. B. K. Rank, C.M.G., F.R.C.S., F.R.A.C.S., who was himself a Sims Commonwealth Travelling Professor in 1958.

ANATOMICAL MUSEUM

THE SPECIAL DISPLAY for the month of September consists of reproductions of paintings of anatomy lessons (recent acquisitions from art galleries in Holland).

IMPROVEMENTS AND ADDITIONS TO ANATOMICAL TECHNIQUES

II. MOUNTING OF ILLUSTRATIONS AND DESCRIPTIONS

by

D. H. Tompsett, Ph.D., B.Sc., and S. C. Bartlett, A.I.S.T.

from the Anatomy Department, Royal College of Surgeons of England

THE EFFECTIVE PROTECTION of illustrations and descriptions which accompany museum specimens, combined with neatness of display, seemed until recently to present insoluble problems.

The advent of Tensol No. 7 cement, produced by Imperial Chemical Industries, Ltd., and designed to stick two sheets of Perspex together, has, however, provided the ideal method of mounting photographs, drawings and typed descriptions.

The first published description of the method used is given by Silcox (1960). Silcox was concerned mainly with small mounts of photographs to be placed inside museum jars. In the opinion of the present writers, a considerable number of modifications are desirable when the mounting of comparatively large illustrations is undertaken, as the technical difficulties increase greatly with the size of mount. Also special precautions are necessary when typing is mounted, as otherwise the typing ink runs badly when it comes in contact with the cement. By the method described below, no serious difficulties are encountered until well beyond the size of 22 × 18 inches.

Photographs are printed on single or double weight Kodak bromide glossy paper. They may be coloured with Velox transparent tints. Descriptions are typed, preferably on an electric typewriter, as this gives a neater and more even type than an ordinary typewriter. When using the electric machine, a carbon ribbon labelled "sharp" should be used in preference to one labelled "normal". The latter gives an intensely black type which, though attractive, may smudge slightly during the subsequent application of a protective film described below. The "sharp" ribbon gives adequate blackness without the risk of smudging.

Typing is done on the *back* of paper identical to that used for the illustrations. Out-dated photographic paper is ideal. It is fixed, washed and dried before the typing is done. If surplus enlargements are used, the image should first be bleached, in case the darker parts show through the paper.

Tensol No. 7 cement causes serious smudging to typing, if it comes into direct contact with it. To prevent this the typed surface of the paper is coated with a suitable barrier solution. The following solution is recommended:

D. H. TOMPSETT AND S. C. BARTLETT

*Mowiol 50-88	.. ..	15 gm.
Distilled water	.. ..	100 ml.
*Manoxol O.T. 20% solution	.. ..	2 ml.
Glycerine	.. ..	0.5 gm.
Formalin	.. ..	2 ml.

The solution is prepared in the following way. The water is heated to a maximum of 80° C., and the Mowiol added slowly with vigorous stirring, preferably with a power-operated stirrer. Prolonged stirring is necessary as the Mowiol is not readily soluble. When it is completely dissolved the other ingredients are added.

A few words about the nature of this solution may be of interest. Mowiol is a form of polyvinyl alcohol which forms a tough and effective barrier to many organic substances. Glycerine is added as a plasticiser to prevent the dry skin of Mowiol becoming too hard and brittle. Manoxol is an exceptionally powerful wetting agent, while the formalin is a preservative. As the solution keeps indefinitely, it is advisable to prepare at least 1,000 ml. at a time. During the first few years a slight precipitate may appear at the bottom of the stock bottle. This can be left undisturbed by careful handling of the bottle, or eliminated by decantation.

Typed paper to be treated with this solution is pinned to a board to prevent it curling. The typed surface is liberally coated with the solution, applied with a one-inch flat bristle paint brush. Then surplus solution is removed from the brush, and the surface of the paper carefully brushed with parallel strokes in one direction. After each stroke surplus solution is removed from the brush by brushing on blotting paper. By this method a complete but even coat of the solution is ensured. The coated paper is left protected from dust until the surface is quite dry.

Before mounting on Perspex the illustration or description is trimmed as small as possible without spoiling its appearance, as the preparation of large mounts is more difficult and more costly than small ones.

The back of the mount is made of opal or black $\frac{1}{16}$ inch thick Perspex. A rectangular piece is cut at least one inch larger all round than the illustration. For large mounts a wider margin is advisable.

The surface of the Perspex is roughened with sandpaper or by a power-operated sanding disc until all traces of shine are removed, as otherwise the photographic paper will not stick well to it.

The illustration or description is stuck to the Perspex in the following way. The illustration is placed on the table face down and a sheet of dry-mounting tissue slightly larger is placed on it. The four corners of

* Mowiol 50-88 is obtainable from the Lawfer Chemical Co., Ltd., 27 Regent Street, London, W.1; Manoxol O.T. from Hardman & Holden, Ltd., Manox House, Canal Street, Miles Platting, Manchester, 10.

IMPROVEMENTS AND ADDITIONS TO "ANATOMICAL TECHNIQUES"

the tissue are touched with a hot knife-blade, which is pressed on the tissue long enough to make it stick to the paper. This is then turned over and the projecting tissue is trimmed off with a sharp knife.

The illustration is then laid on the roughened surface of the Perspex and carefully orientated. It is placed for five minutes in an electrically heated mounting press set to the temperature recommended by the makers of the dry-mounting tissue. Mounting must be well done with no air trapped under the paper, as this might jeopardize successful embedding.

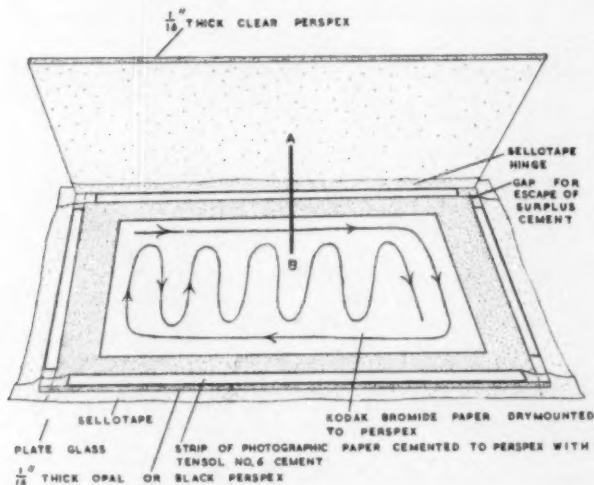


Fig. 1. Diagram to show the set-up when an illustration is being cemented between two sheets of Perspex. The arrowed line shows the method of pouring the cement to cover the illustration completely. A vertical section through line A-B is shown in Figure 2.

Figures 1 and 2 show the set up for cementing together the two sheets of Perspex which enclose the illustration. The sheet of opal or black Perspex to which the illustration has been fixed is placed on a sheet of glass resting on the table. Four narrow strips of paper of the same thickness as that used for the illustration are stuck with Tensol No. 6 cement along the edges of the Perspex. The purpose of the strips is to prevent the upper sheet of clear Perspex from being pressed right down on the lower one. They ensure that a layer of cement remains between the two sheets of Perspex which finally enclose the illustration. There must be small gaps (see Fig. 1) at each corner through which surplus cement can escape.

Next the edges of the Perspex are stuck to the glass all round with four lengths of Sellotape, which is fixed over the strips of photographic paper. The Sellotape not only holds the Perspex sheet steady and keeps it flat, but also prevents surplus cement from contaminating the under-surface of the Perspex.

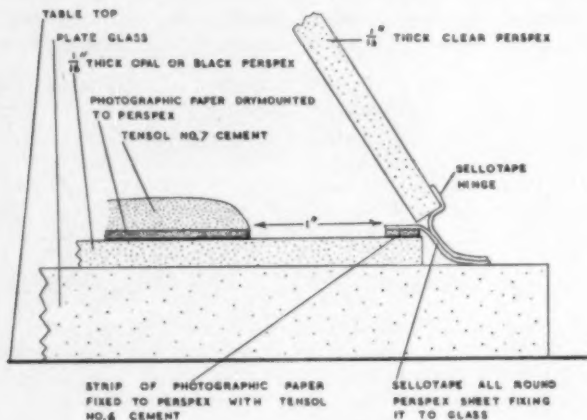


Fig. 2. Vertical section through line A-B in Figure 1, not drawn to scale. When the clear Perspex sheet is lowered and pressed firmly down, the cement spreads out all round the illustration, filling completely the 1-inch margin. Surplus cement and air bubbles escape through gaps at the corners, shown in Figure 1.

A sheet of clear $\frac{1}{16}$ inch thick Perspex, which is to cover the illustration, is cut to the same size as the lower sheet. The clear Perspex is washed thoroughly in warm water containing a detergent. Then it is dried and fixed in position by means of a Sellotape hinge as shown in Figures 1 and 2. This facilitates the lowering of the upper Perspex sheet onto the cement-covered lower one.

Tensol No. 7 cement is supplied in kits.* Each consists of 400 ml. of component A, which is a clear syrup of low viscosity, and 25 ml. of B, which is a liquid catalyst.

* Boxes containing 12 kits can be obtained from Imperial Chemical Industries, Ltd. Single kits can be purchased from Visijars, Ltd., 149 London Road, Croydon, Surrey.

IMPROVEMENTS AND ADDITIONS TO "ANATOMICAL TECHNIQUES"

The cement is prepared immediately. To begin with, 1 ml. cement should be prepared for each square inch to be covered, but with increasing experience 1 ml. can be used to cover 1½ square inches. The cement should be used in a cool room away from draughts and sunlight, which may cause evaporation of the monomer, so that a skin is formed on the cement before the mounting is completed.

The appropriate amount of cement is poured into a beaker and 4 per cent. catalyst added. This is stirred in until streaks in the mixture disappear. The beaker is then covered and left standing on the bench for ten minutes, while large air bubbles rise to the surface. Small bubbles remaining may be ignored.

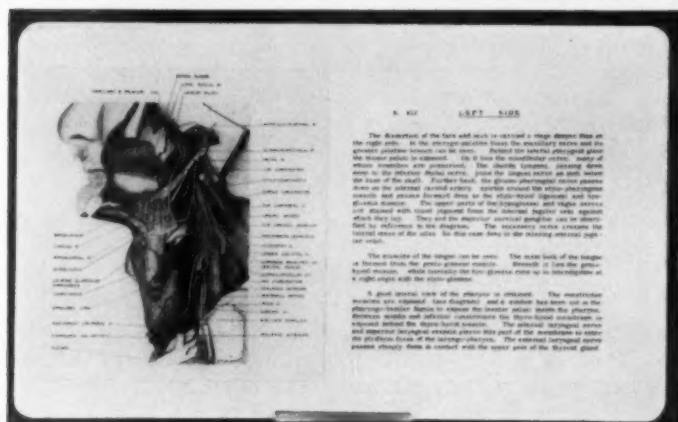


Fig. 3. A photographic reproduction of an anatomical drawing and a typed description mounted by embedding between two sheets of Perspex.

The cement is poured over the illustration by the method shown in Figure 1. About two-thirds of the cement is used in the initial pouring, the remaining one-third being used to fill gaps. It is essential that the illustration be covered completely by cement.

Next the clear Perspex sheet is lowered carefully onto the cement and pressed firmly down. This causes the cement to spread to the margins all round the illustration. Judicious pressing ensures an even spread. Air bubbles trapped under the clear Perspex are coaxied to the margins. Most bubbles can be expelled with surplus cement which escapes at the four corners. Small bubbles remaining at the sides along the strips of paper may be ignored as this part of the Perspex is trimmed off later. Excessive pressure must not be applied as, if too much cement is squeezed out, air may be sucked in.

Finally, light weights of a few pounds each are placed on the surface of the Perspex to keep the top sheet firmly down and prevent any air getting back while the cement solidifies by polymerization. The number of weights depends on the size of the mount. The minimum weights necessary to prevent air sucking back should be used.

Under average conditions the cement solidifies in about an hour. An hour after it sets, the mount is detached from the glass sheet to which it was fixed by Sellotape. Surplus cement which may have flowed out onto the glass is easily prised up as it does not stick strongly to glass at this stage.

The mount is left for at least 24 hours for the cement to harden before it is trimmed. This can be done on the bandsaw. A minimum of $\frac{1}{4}$ inch margin must be left round the illustration, as the cement does not stick to the photographic paper. For large mounts the margin should be much wider, as it is only this which holds the upper and lower sheets of Perspex together. Figure 3 shows an illustration and description mounted in Perspex by this method. The actual size of this mount is 11 x 18 inches.

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TOMPSETT, D. H. (1956) *Anatomical Techniques*. Edinburgh and London, Livingstone.

FACULTY OF DENTAL SURGERY L.D.S. CENTENARY CUP

AT THE ANNUAL MEETING of the Faculty of Dental Surgery held on Friday, 21st July 1961, the Dean of the Faculty, Professor Martin Rushton, C.B.E., on behalf of the Licentiates in Dental Surgery of the College, presented to the President, Sir Arthur Porritt, K.C.M.G., K.C.V.O., C.B.E., representing the Council, a Cup to be known as the L.D.S. Centenary Cup.

In presenting the Cup, the Dean said:

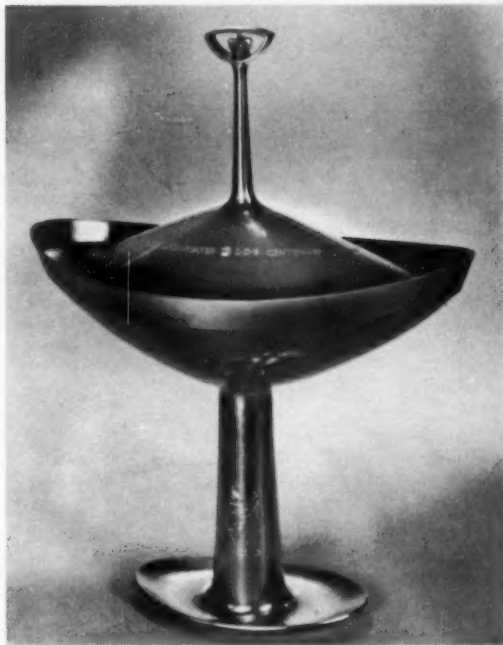
"It is just over 100 years since this Royal College obtained the Charter which permitted it to establish the Licence in Dental Surgery. Forgotten now are the disputes which threatened to divide the profession at that period: the decision to ally dentistry with the Royal College of Surgeons of England determined the pattern of development of the dentist in the United Kingdom, a pattern which was followed by other Royal Colleges and Faculties and eventually by universities also.

"While all dentists throughout the Kingdom owe a debt to this College, it is natural that those who hold the Licence of the Royal College of Surgeons of England should have wished to express in some memorable way the feelings of gratitude which arise from so long and fruitful an association. Of these I am to-day the mouthpiece. We have caused to be made a silver cup, the L.D.S. Centenary Cup, designed, made and inscribed by an artist and master-craftsman, Mr. E. G. Clements, expressly for the purpose.

"We ask you, Mr. President, to accept it and we hope it may long stand among the College plate as a memorial of the first hundred years of our association and a testimony to the appreciation the Licentiates have wished to express."

L.D.S. CENTENARY CUP

Accepting the gift, the President admired the grace and beauty of the Cup and thanked the Dean for his understanding words. He spoke of the way in which the College treasured the association and friendly liaison that had existed over the past hundred years and expressed his confidence that this sense of friendship, which was obviously growing, would cause the Faculty and College to flourish for at least a further hundred years.



Photograph by courtesy of the Worshipful Company of Goldsmiths

On behalf of the College the President told the Meeting how much the Council would be touched by the gratitude of the Licentiates and by the gesture that prompted the gift of the L.D.S. Centenary Cup.

PROCEEDINGS OF THE COUNCIL IN AUGUST

AT A MEETING of the Council on 3rd August 1961, with Sir Arthur Porritt, President, in the Chair, Professor H. W. Rodgers, O.B.E., F.R.C.S., of Belfast, Mr. A. S. Aldis, F.R.C.S., of Cardiff, and Mr. H. Daintree Johnson, F.R.C.S., of the Royal Free Hospital, were admitted to the Court of Examiners.

Mr. R. L. B. Beare, F.R.C.S. (St. Mary's and East Grinstead), was admitted to the Board of Examiners in Dental Surgery (Surgical Section), and Dr. J. Alfred Lee, F.F.A.R.C.S. (Southend General Hospital), was admitted to the Board of Examiners for the Fellowship in the Faculty of Anaesthetists.

Surgeon Rear-Admiral D. D. Steele-Perkins, C.V.O., was admitted to the Fellowship. This is the first admission of a Fellow of the Royal Australasian College of Surgeons to the Fellowship of this College *ad eundem*.

The Mitchiner Medal for 1961 was presented to Brigadier L. R. S. MacFarlane, O.B.E., M.D., by the Medical Director of the Army Medical Services, who came to the Council meeting for this purpose.

The Lady Cade Medal was presented to Wing Commander J. M. Urquhart, M.B., Ch.B., D.P.H., by the Director of the R.A.F. Medical Services.

The Hallett Prize was presented to Dr. Peter Fells of the University of Cambridge and University College Hospital.

R. T. Watson of Marlborough College was admitted as the thirtieth Macloghlin Scholar. He will hold his scholarship at the University of Cambridge.

Handcock Prizes were awarded to Miss J. B. Brown of St. Thomas's Hospital Medical School and to N. K. Coni of Westminster Medical School, on the result of the recent final examination in surgery for the Membership of the College.

The award of the Sir Gilbert Blane Medal for 1961 to Surgeon Lieutenant-Commander J. H. Sewart, M.B., B.Ch., D.P.H., R.N., was reported. He has compiled an exhaustive review of the factors affecting tuberculosis in the Navy.

The re-election of Professor M. A. Rushton, C.B.E., F.D.S.R.C.S., as Dean and the election of Professor A. B. MacGregor, F.D.S.R.C.S., as Vice-Dean of the Faculty of Dental Surgery for the ensuing year were reported.

PROCEEDINGS OF THE COUNCIL IN AUGUST

The Evelyn Sprawson Prize was awarded to Nicholas Antony Sturridge of the Royal Dental Hospital on the result of the last examination for the Licence in Dental Surgery.

Sir Wilfrid Le Gros Clark, F.R.S., F.R.C.S., was appointed the Edridge-Green Lecturer for 1961.

A Diploma of Fellowship was granted to Sim-Fook Lam of Hong Kong.

Diplomas of Fellowship in Dental Surgery were granted to 11 successful candidates (see page 169).

Diplomas of Fellowship in the Faculty of Anaesthetists were granted to 42 successful candidates (see page 159).

Diplomas of Membership were granted to 135 candidates who were successful at the July examinations of the Examining Board in England.

Diplomas were granted, jointly with the Royal College of Physicians, in Laryngology and Otology to two candidates and in Industrial Health to ten.

The following hospitals were recognized under paragraph 23 of the Fellowship regulations:

HOSPITALS	POSTS RECOGNIZED		
	General (6 months unless otherwise stated)	Casualty (all 6 months)	Unspecified (all 6 months)
OLDHAM and District General Hospital (additional)			<i>Under para. 23 (c)</i> S.H.O. (E.N.T.)
BATH—Bath and Wessex Ortho- paedic Hospital			2 S.H.Os. (Orth.)
BURY ST. EDMUNDS—West Suffolk Hospital (transfer of recognition)			S.H.O. (Cas. & Orth.) transferred from general section
MACCLESFIELD Hospital (restora- tion of recognition)	Surg. Registr. S.H.O.		
AUSTRALIA—Townsville Hospital, Queensland	Surg. Registr.		
MALAYA—Kuala Lumpur, General Hospital until August, 1963	2 Surg. Registrs.	Cas. Offr.	Registr. (Orth.)
MALAYA—Penang, General Hospital until August, 1963	2 Surg. Registrs. 6 H.Ss.	Cas. Offr.	<i>Under para. 23 (b)</i> Registr. (Ophth.)

It was decided to hold a Primary Examination for the Fellowship in Khartoum in March 1962.

Proposals for the institution of an annual Gordon-Taylor Memorial Lecture were approved.

The Council received a very interesting report from Professor F. A. R. Stammers on his recent visit to Khartoum and agreed to the recognition of the Faculty of Medicine of the University of Khartoum for a further year.

It was decided to build an extension for the enlargement of the Research Department of Anaesthetics in the College.

BRITISH MEDICINE AND THE DEVELOPING COUNTRIES

A CONFERENCE held at the Royal College of Surgeons on 27th July was attended by about sixty people, representing universities, medical associations, research foundations, and Government Departments. Sir Arthur Porritt, P.R.C.S., explained why the College had felt it necessary to call together representatives of the many bodies concerned with providing medical aid to the developing countries. Without some organization to coordinate these interests and activities, there would be much frustration and wastage of money, man-power, and ideas. Coordinated action was urgent, but it required the full and enthusiastic support of Governments, both in this country and in other parts of the Commonwealth. He hoped that, despite the present economic difficulties, this support would be backed by the provision of the substantial funds which would be needed. Urging the conference to think imaginatively, Sir Arthur suggested that they should have in mind as an ideal a "Commonwealth Medical Service", which might include some underdeveloped countries outside the Commonwealth, and which would provide a free exchange of personnel at all levels, and a redeployment of medical man-power so as to assist those parts of the world which were desperately underdoctored.

Sir Miles Clifford emphasized the desire of very many of the emerging countries, despite the growth of nationalist feeling, to seek medical help from this country in preference to any other. He believed it would be a tragic error if Great Britain were to turn its back on the opportunity to use its medical resources to the best purpose in assisting these countries. He was confident that the medical foundations of this country and the Commonwealth would be glad to play their part in any scheme for providing coordinated assistance to the emerging countries.

In the subsequent discussion all speakers agreed on the urgent need for action, and for coordinated action, under some central organization. There were various opinions as to whether this central organization should be under the aegis of Government, the universities, or the Royal Colleges.

Mr. P. Rogers, on behalf of the Government's new Department of Technical Cooperation, said that the Department would certainly require advice from the medical profession and would welcome the establishment, either under the aegis of the Department or independently of it,

BRITISH MEDICINE AND THE DEVELOPING COUNTRIES

of a coordinating committee which could be consulted and could make plans. With the unanimous approval of the conference a committee was appointed to nominate the members of a small working party to devise coordinating machinery.

The Working Party

At a meeting of the nomination committee on 15th August, it was felt that the working party would need to stimulate a two-way traffic, encouraging doctors, teachers, and specialists to go to countries overseas, and facilitating arrangements for postgraduate students to come to this country for training. It would, moreover, have to ascertain the needs existing in overseas countries, and act as a centre of information. Its terms of reference were defined as follows:

To consider at a professional level the methods by which British medicine can contribute to the development of medical science and the medical services in the developing countries.

The committee thought that, though the Department of Technical Cooperation would certainly require advice from the medical profession and would be setting up its own medical panel, the working party must be an independent body. It must, however, have direct access to the Minister of Technical Cooperation and the Minister of Health.

It was agreed that the working party should not consist of representatives of named institutions nor of individuals chosen solely for their suitability for the work, but rather of suitable individuals who could be regarded as representative of medical categories.

DONATIONS

DURING THE LAST few weeks the following generous donations have been received:

Appeal Fund—Donations:

£5,000	The Agnes Spencer Charity Trust (further gift).
£105	Allen West & Co., Ltd. (further gift)
£52 10s. 0d.	Brecknell, Dolman & Rogers
£50	The Avon India Rubber Co., Ltd.
	Anonymous donor
£26 5s. 0d.	G. B. Britton & Sons, Ltd.
	A. C. V. Telling (Bristol), Ltd.
£5 5s. 0d.	H. J. Dolman, Esq.
	Spencer (Melksham), Ltd.
	H. B. McMillan, Esq.
£4	Miss W. Pemberton (further gift)

Donations by Fellows:

The following Fellows of the College have generously given a donation:

Sir Stanford Cade, K.B.E., C.B., F.R.C.S.
N. Capener, F.R.C.S.

W. R. Hunter, F.R.C.S.
E. T. C. Milligan, F.R.C.S.

GUILDFORD CATHEDRAL

THE DOCTORS' WINDOW in Guildford Cathedral will be dedicated at a service to be held in the Cathedral on St. Luke's Day, Sunday 22nd October, at 3 p.m.

DIARY FOR SEPTEMBER

Mon.	18		First Membership Examination begins.
Tues.	19		Primary F.F.A. Examination begins.
Wed.	20		D.Orth. Examination begins.
Fri.	22	5.00	Board of Faculty of Dental Surgery.
Tues.	26		Final Membership Examination begins.

DIARY FOR OCTOBER

Mon.	2		Basic Sciences Lectures and Demonstrations and Anaesthetic course begin.
		5.15	G. H. BAINES—Surgical Lecture—Injuries to the bladder and urethra.
		6.30	A. H. M. SIDDONS—Surgical Lecture—The selection of patients for pulmonary resection.
Tues.	3	5.00	PROFESSOR C. Q. HENRIQUES—Hunterian Lecture—Veins of the vertebral column and their role in the spread of cancer.
		6.15	J. P. HOPEWELL—Surgical Lecture—Testicular tumours.
Wed.	4	5.00	Board of Faculty of Anaesthetists.
		5.15	E. J. L. LAWBUURY—Surgical Lecture—The control of cross-infection in surgery.
		6.30	M. A. C. PARKS—Surgical Lecture—Non-malignant conditions of the anus and rectum.
Fri.	6	5.15	PROFESSOR A. C. DORNHORST—Surgical Lecture—Salt and Water.
		6.30	H. H. NIXON—Surgical Lecture—Duplications of the digestive tract.
Mon.	9		Final L.D.S. Examination (Part I) begins.
		5.15	H. J. SEDDON—Surgical Lecture—Nerve injuries.
		6.30	D. H. PATEY—Surgical Lecture—Survey of the salivary glands.
Tues.	10	6.30	RODNEY SMITH—Surgical Lecture—Hepatectomy.
Thurs.	12	2.00	Quarterly Council.
Fri.	13		Anaesthetic Course ends.
Mon.	16		Final Fellowship Examination (Ophthalmology and Otolaryngology) and D.M.R.D. Examination (Part II) begin.
Tues.	17		Final L.D.S. Examination (Part II) begins.
		5.15	H. G. HANLEY—Surgical Lecture—The treatment of genito-urinary tuberculosis.
		6.30	D. M. WALKER—Surgical Lecture—Bladder tumours.
Mon.	23		Dental Lectures and Clinical Conferences begin.
			D.Path. Examination and D.M.R.T. Examination (Part II) begin.
Tues.	24		Dr. A. J. M. REESE—Erasmus Wilson Demonstration—Tumours of the kidney.
Wed.	25		Primary F.R.C.S. Examination begins.
		5.00	Dr. D. H. TOMPSETT—Arnott Demonstration—Casts of the bronchial tree.
Thurs.	26		Thomas Vicary Commemoration.
			Final Fellowship Examination (General Surgery) and D.T. & M. Examination begin.
		5.00	SIR CLEMENT PRICE THOMAS—Thomas Vicary Lecture—

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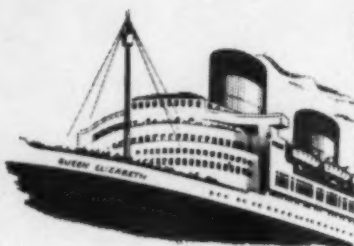
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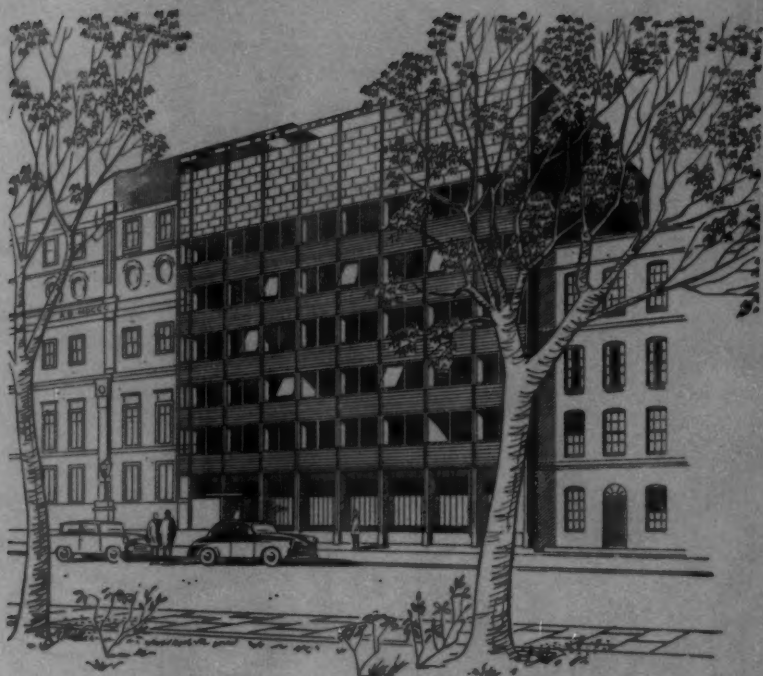
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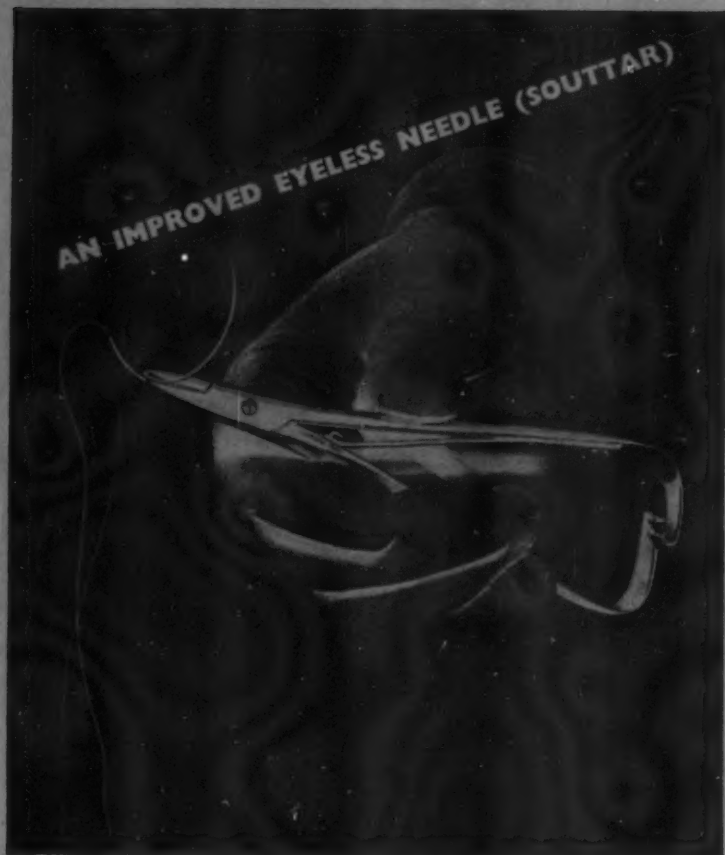


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